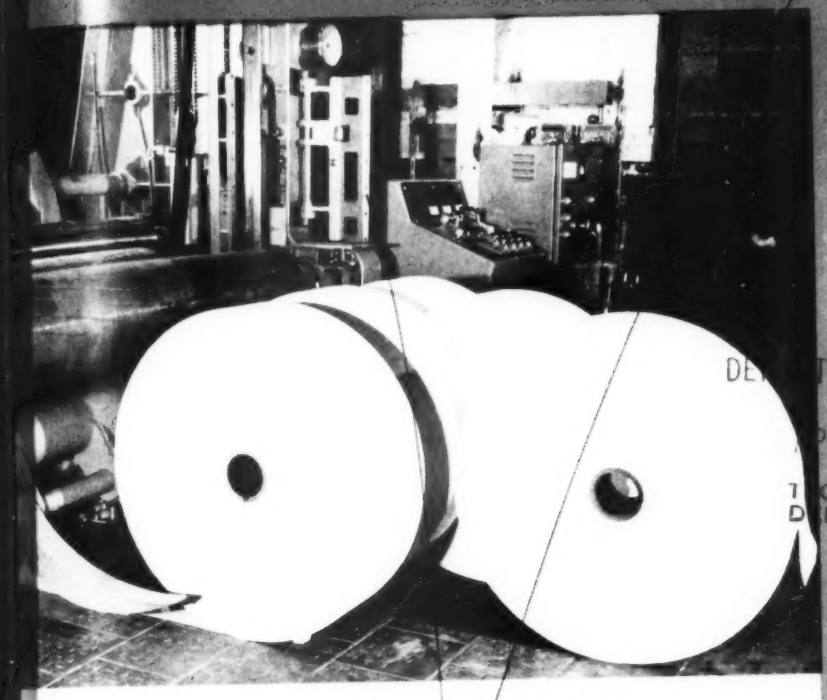
APRIL 1960

IN TWO SECTIONS—SECTION ONE

The Paper Industry



Clean cut rolls ejected from Westvaco's new winder

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TECHNOLOGY
DEPARTMENT

- *Heat seal and hot melt adhesives*
- *First pneumatic winder installed at Westvaco*
- *Planer chips for pulp*
- *Clarifying high-color low-turbidity water*

Publishers of Paper and Pulp Mills Catalogue

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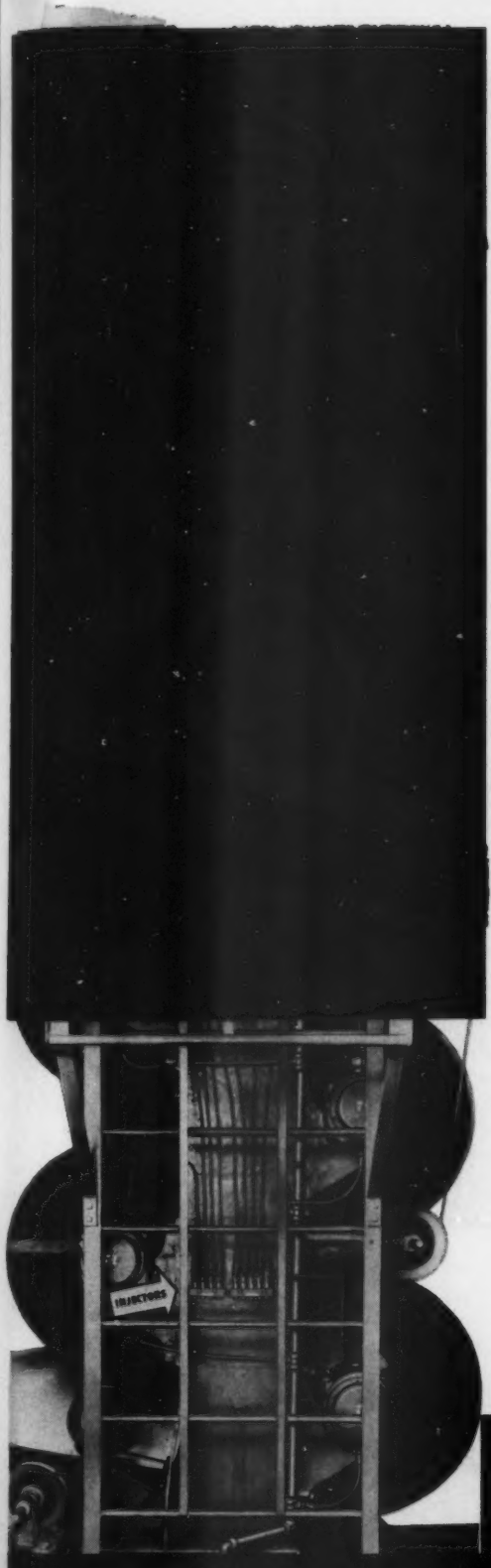

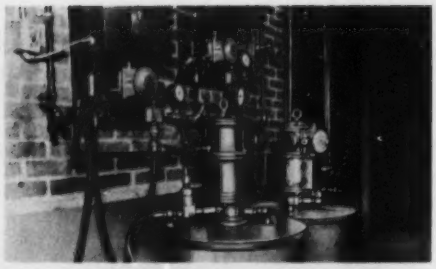

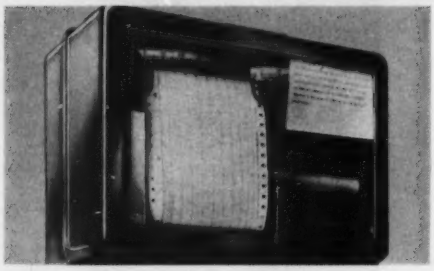

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The Paper Industry

Technology • Engineering • Management • Production

VOLUME 42 **NUMBER 1** **APRIL 1960**

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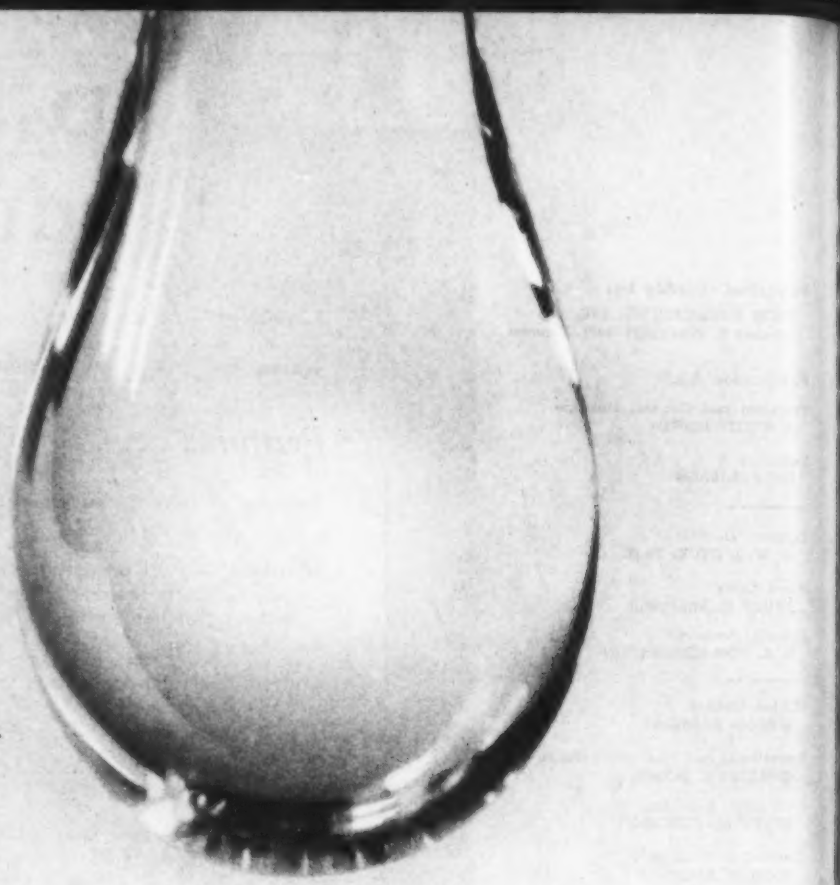
water



comes in oceans, rivers, lakes, wells,
drops, buckets, pitchers and glasses.
it quenches thirsts, cooks food, puts
out fires, makes coffee and
brushes teeth, it spins mills,
runs electro-plants, cools motors
and power factories.
it spawns fish, sprinkles lawns,
floats boats, washes children
and grows flowers.

it sustains and nurtures.
it bends if you give it purpose.
it reshapes itself if you give it reason.
it is needed, wanted, feared,
praised and prayed for.

it is at the heart of all life.
it is in the arteries of all industry.
it is as close to us as skin
but as taken for granted as sky.

the end of water seems unbelievable.
if it is not on the horizon, it is just over it.
if it is not within sight,
it is just 'round the bend.
if it is not in the glass,
it is just in the spigot.

. . . this is the grand mirage . . .
the self-delusion that prevails
though the wells run low
and the streams go dry
and the water slips away.

we know water.
we know its ways.
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we've pulled it out of swamplands,
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pumped it into deserts,
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and rescued it from pollution.

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From our point of view..

Give your salesman the tools he needs

With an anticipated sale of a record volume of printing and industrial papers in 1960, valued at $3.4 billion and paralleling an expected investment of $700 million in new plant and equipment in the pulp and paper manufacturing industry, it was not surprising that the National Paper Trade Association at its 1960 annual meeting focused considerable attention on the distribution of this vast paper tonnage.

The concern about finding markets for a full-capacity output of the added manufacturing facilities reflects a problem that warrants considerably more conscious effort than has been given to it in the past. There is a currently prevailing argument that, during the recent period of the "easy sell", many salesmen have lost the quality of real salesmanship which characterized them during the "hard sell" era. Such an argument has all the earmarks of a defensive measure that stems from a tacit admission of top-management's negligence in not having given the subject of selling and marketing the full attention it deserves.

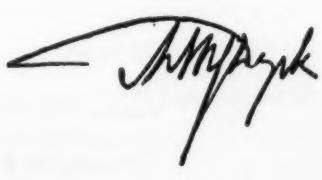
It should be noted that the mere resurrection of the "hard-sell" salesman, with his inherent drive and ingenuity, is not going to solve all our marketing problems. While it was usually possible in the pre-war era for a salesman to assure his company a fair share of the market by exerting the qualities of drive and ingenuity, today the art of effective selling and marketing has grown much more complex and requires additional qualifications. The salesman must be familiar with many technical aspects of his company's products and must learn to use the cooperative services of application-engineering and technical services that the customer now demands of the manufacturer.

It would seem that the recent period of "easy sell" can only be held partly responsible for the absence of the proverbial drive and ingenuity in many salesmen. It is more plausible to conclude that unfamiliarity with the company's product, new marketing techniques and cooperative agencies within the company has caused the salesman to lose much of his inherent confidence.

This places full responsibility directly on top-management for not having had the foresight to implement adequate training programs that would equip their salesmen with the technical product information details of the services offered and a familiarity with new marketing techniques.

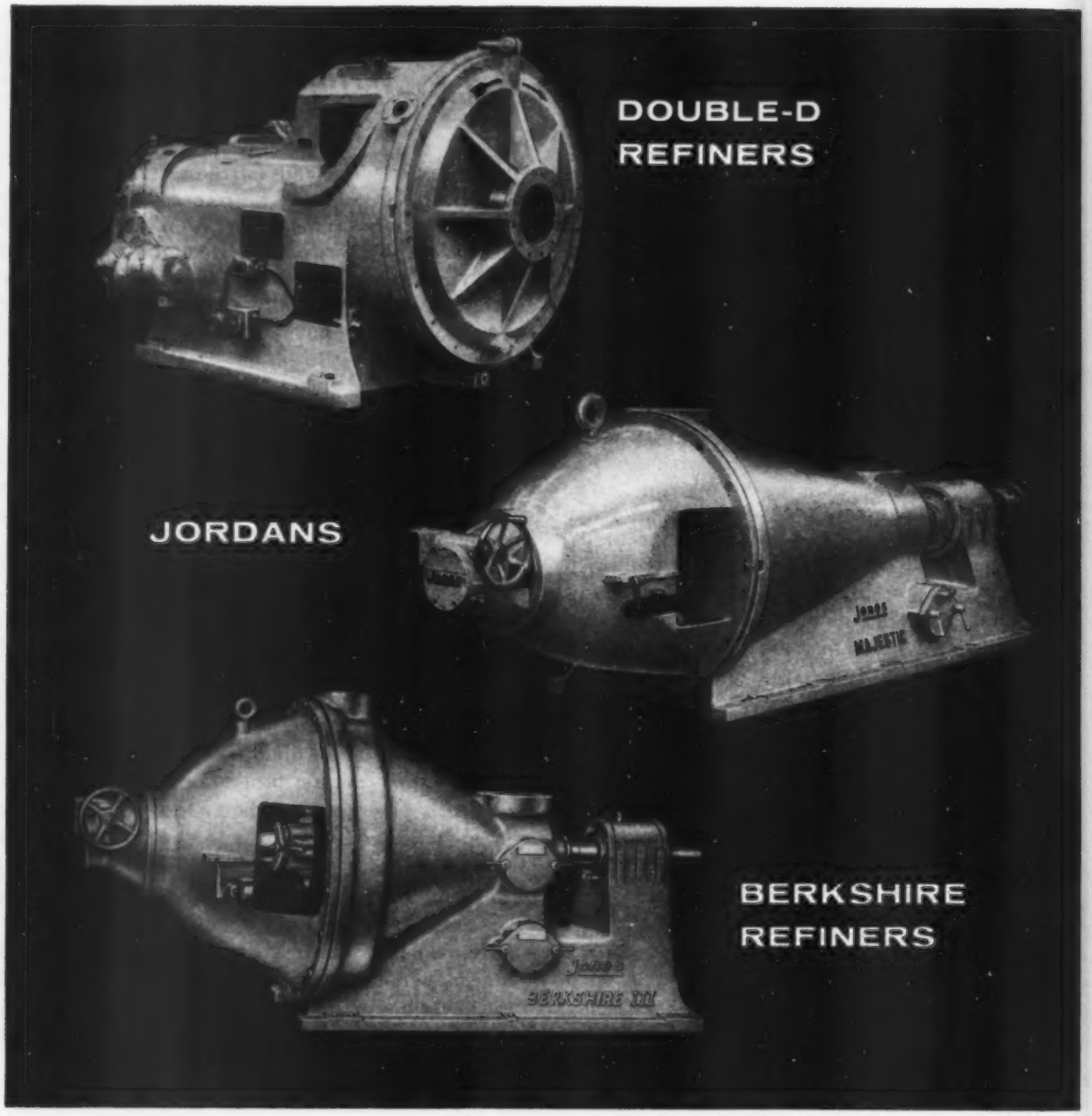
It is gratifying to note that many positive steps are now being taken to correct many of these deficiencies. As reported by G. Willing Pepper at the NPTA meeting, Scott Paper Co., in the summer of 1959 put a plan into operation to train some twenty young paper merchant salesmen in the use of new marketing techniques.

There can be no doubt of the highly beneficial results these training programs will entail. In Mr. Pepper's own account, the twenty trainees "were hard-working, inquisitive and quick to participate in any phase of the program". There is no longer any need for remaining on the defensive, indulging in nostalgic wishes for the return of the "hard-sell" salesman, and putting the responsibility for lost or unconquered markets on the ineffecient operation of the sales organization, when — in all probability — all that is needed is provide the salesman with better tools to do the job.



Jones refiners

CHOICE OF THE NATION'S



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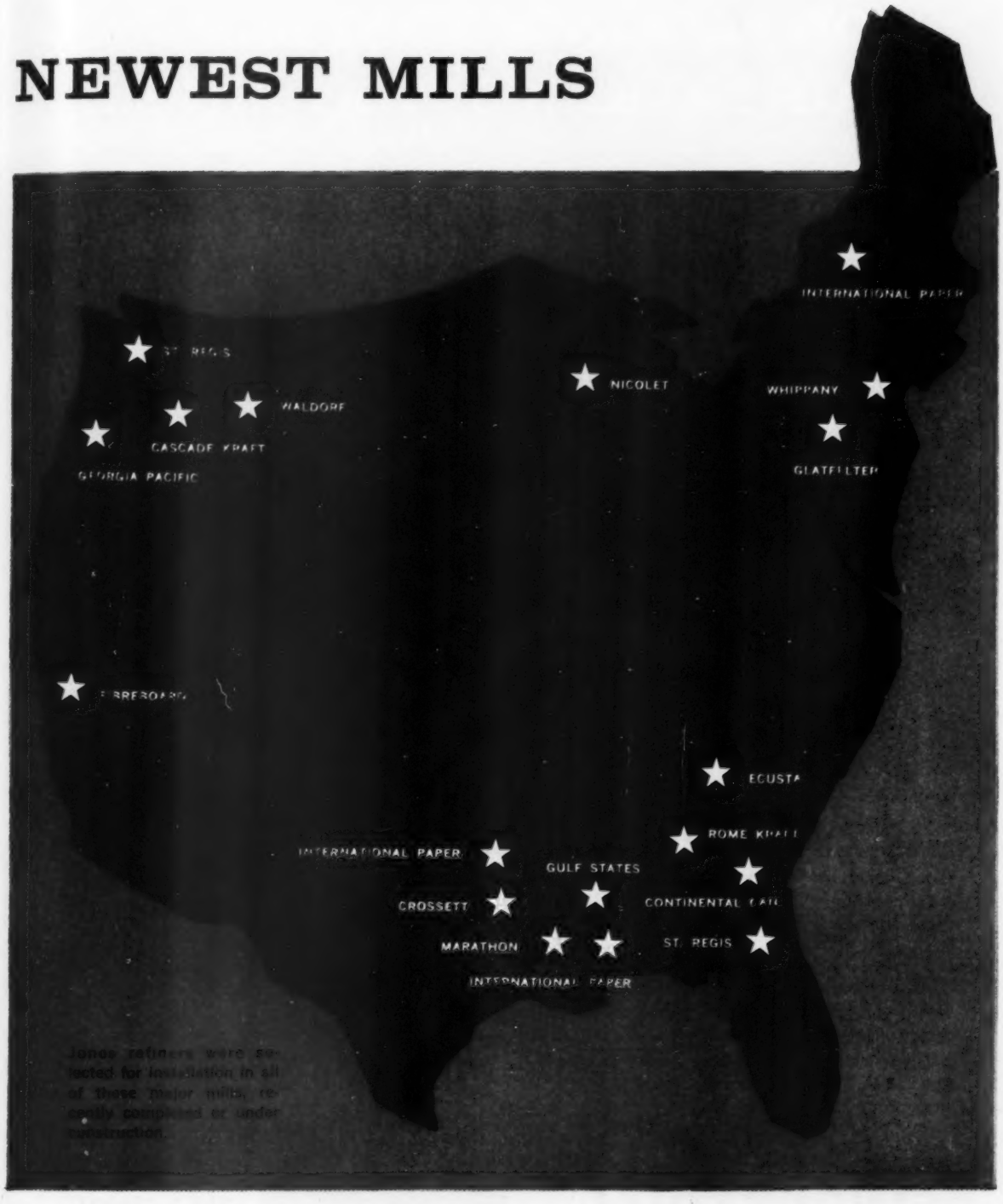
NEWEST MILLS



Jones refiners were selected for installation in all of these major mills, recently completed or under construction.

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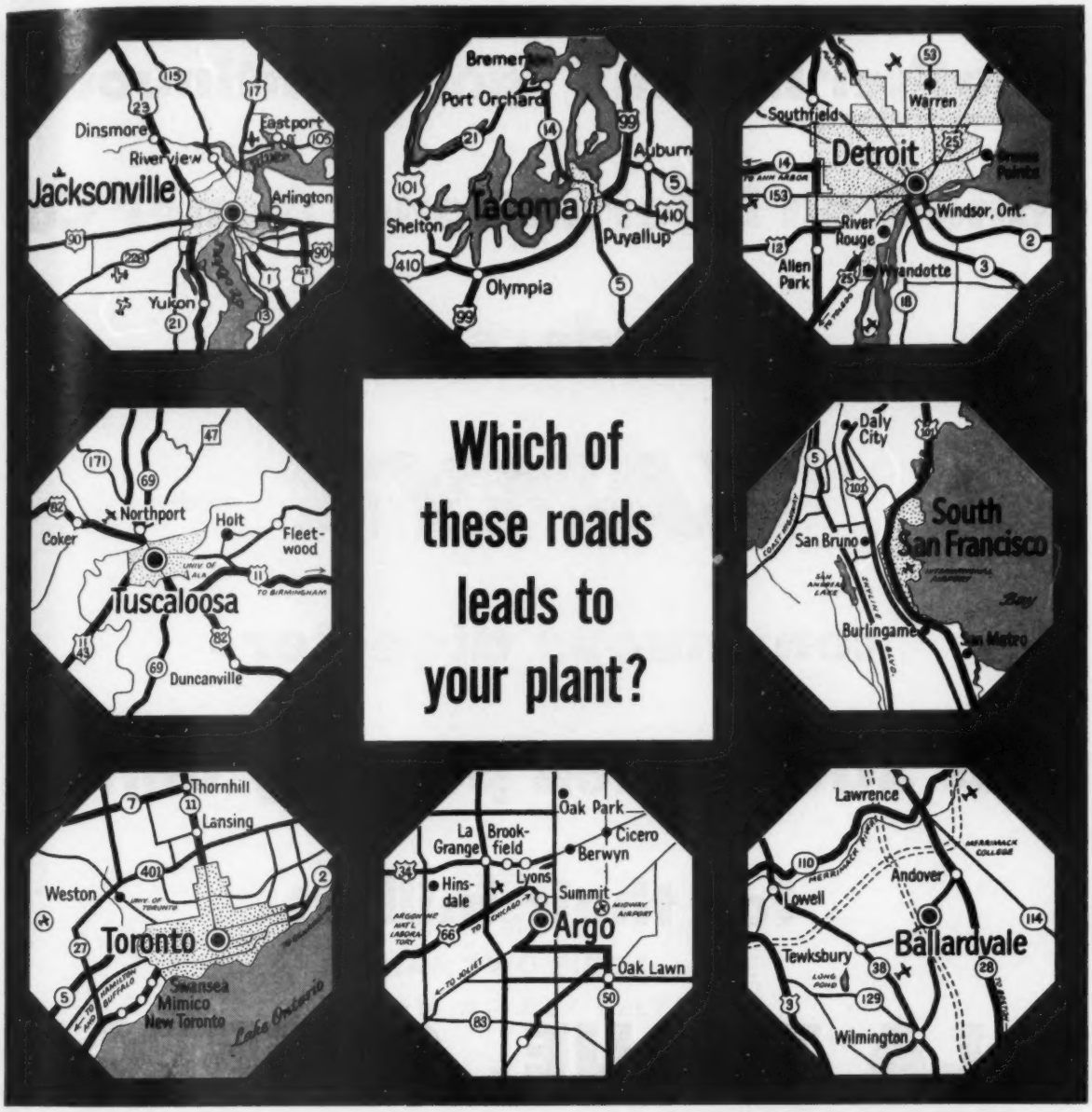

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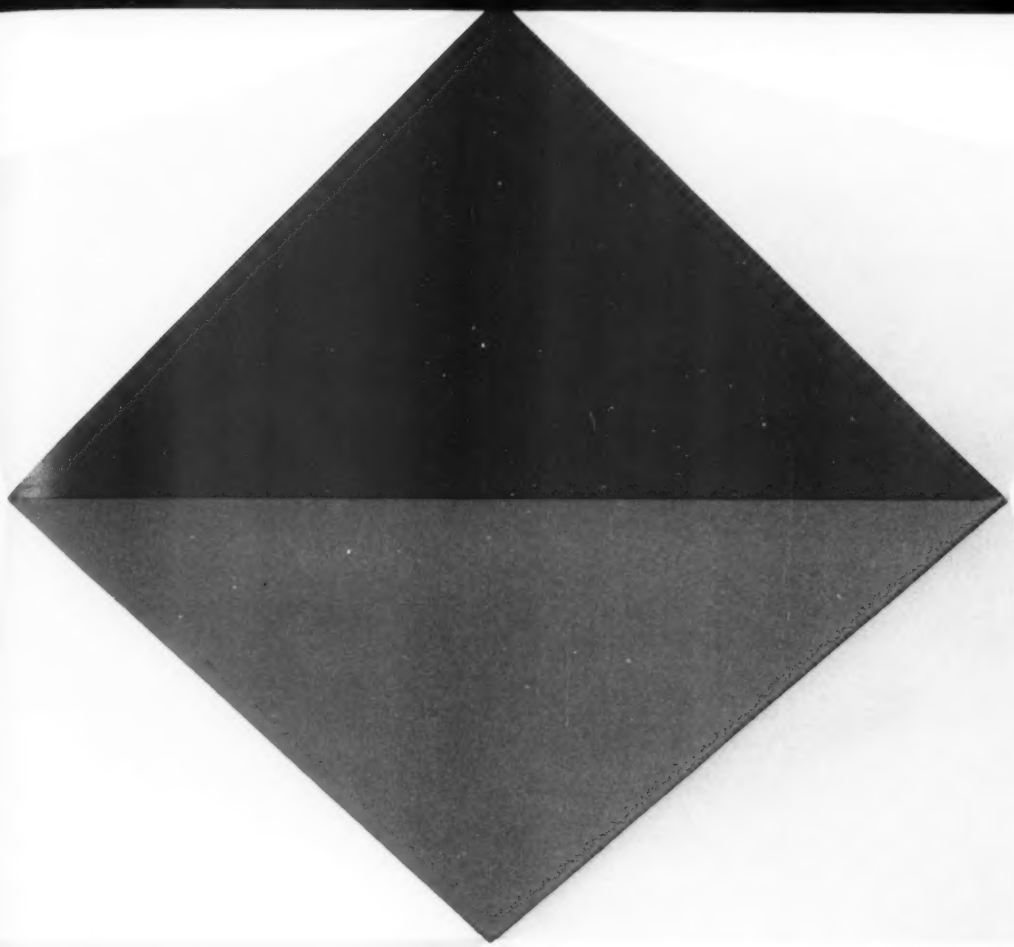

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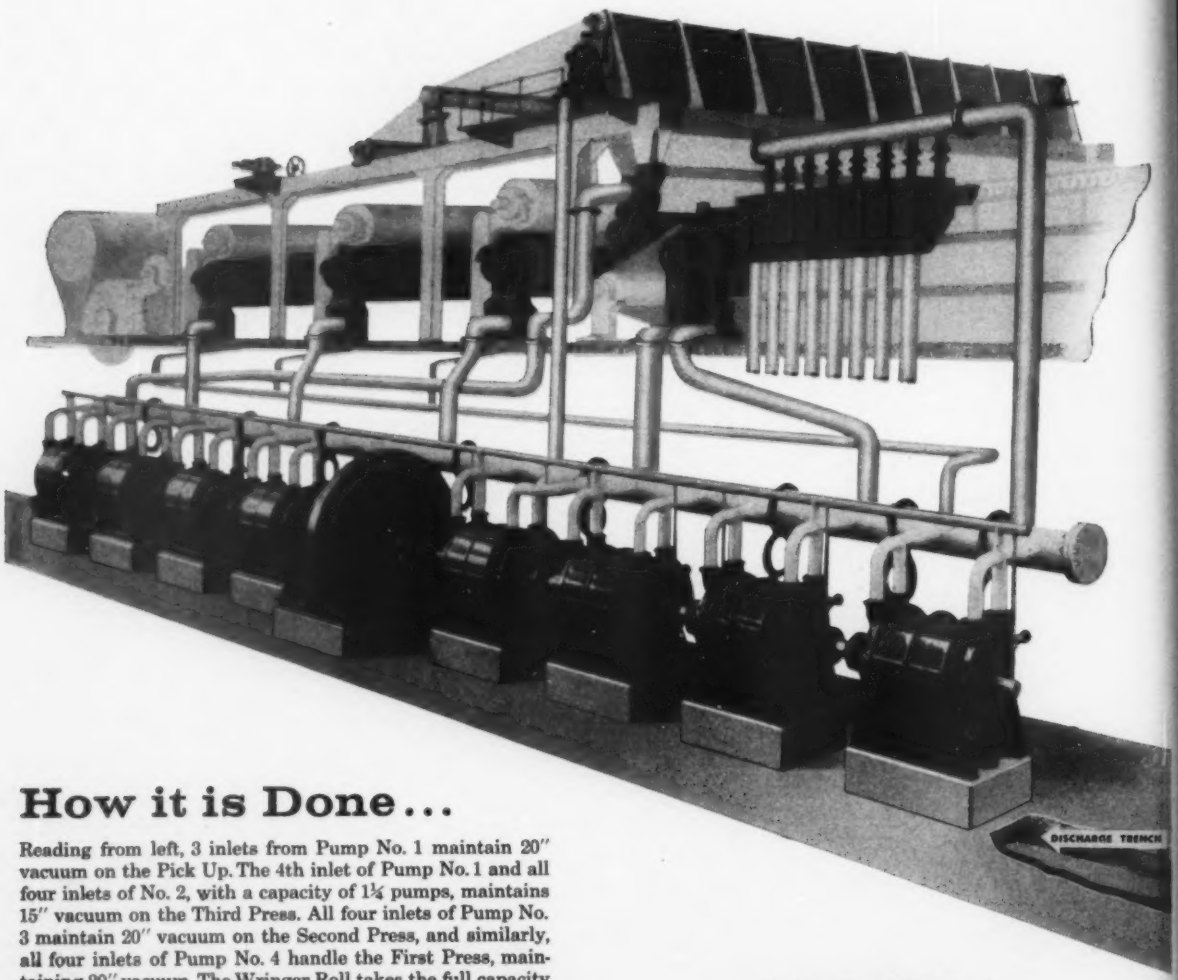

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Reading from left, 3 inlets from Pump No. 1 maintain 20" vacuum on the Pick Up. The 4th inlet of Pump No. 1 and all four inlets of No. 2, with a capacity of 1¼ pumps, maintains 15" vacuum on the Third Press. All four inlets of Pump No. 3 maintain 20" vacuum on the Second Press, and similarly, all four inlets of Pump No. 4 handle the First Press, maintaining 20" vacuum. The Wringer Roll takes the full capacity of Pump No. 5, requiring 10" vacuum. The High Vacuum Couch Box takes a pump and a half, 4 inlets of Pump No. 6, and two inlets of Pump No. 7, maintaining 20" vacuum. The remaining two inlets of Pump No. 7 maintain 10" vacuum on the Low Vacuum Couch Box. Only one inlet of Pump No. 8 is required to handle the Felt Conditioners at 10" and the remaining three inlets of Pump No. 8 handily maintain 10" vacuum on the Wire Boxes.

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Available in 3 sizes, to handle volumes from 1500 to 6000 gpm

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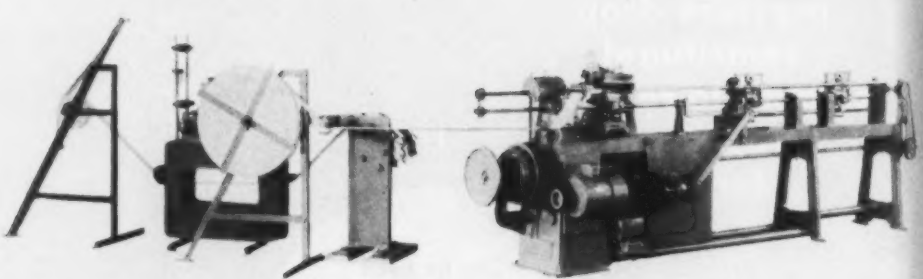

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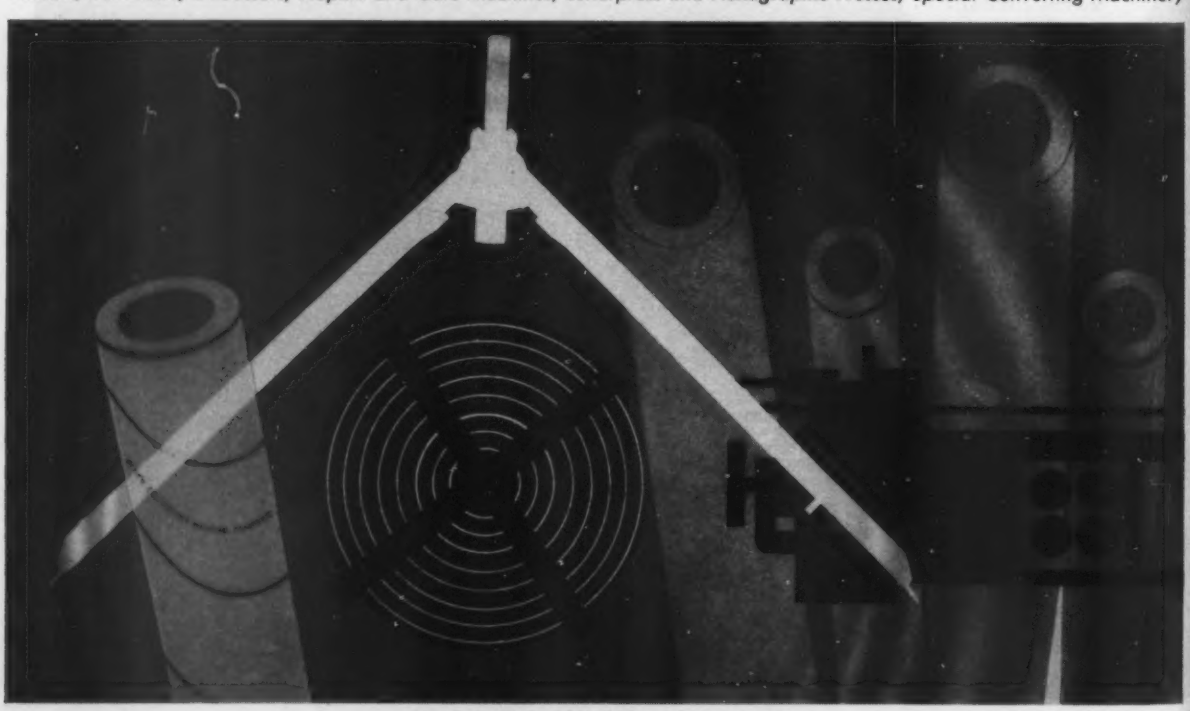

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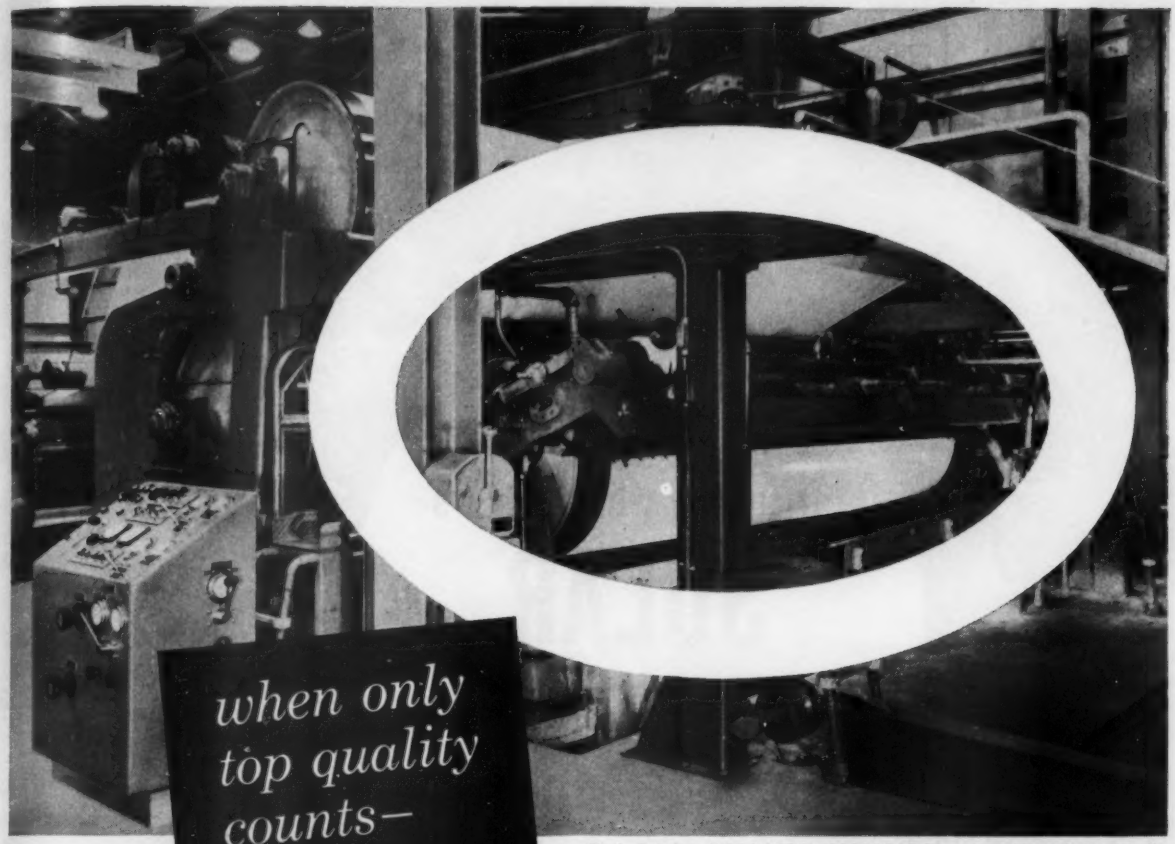

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Feature articles

Conventional planer shavings vs. special planer chips for pulp

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Blankers produce satisfactory chips for pulping purposes. The possibility exists of developing a disk-type cutterhead that would yield satisfactory chips and also a smooth surface.

ANNUAL PULPWOOD production has approached two billion cubic feet of wood in recent years. Meanwhile the United States planing mills have, at a conservative estimate, made one-third of a billion cubic feet of lumber into shavings every year. Apparently the question of the extent to which planer shavings could be made more suitable for pulp by modifying the cutterhead has never been seriously considered until the last two or three years.

Many sawmills are so located that they can sell lumber or chips, or both. If a log is worth more for lumber than for chips, the logical thing is to make the maximum of lumber and the minimum of chips. This means that any chips produced would come primarily from slabs and edgings, rather than from sawing lumber oversize in the first place, and then planing off the excess wood.

On the other hand, some logs are more valuable for pulp chips than for lumber. These might better be made directly into chips than put through a sawmill and made into a mixture consisting of 50 per cent lumber, 25 per cent sawdust, and 25 per cent chippable slabs and edgings.

Conventional Planer Shavings

Typical size and shape

Fig. 1 shows a planer cutterhead of a common size (6 in. making a cut on a 4/4 board. The cut is ¼ in. deep and the feed gives four knife cuts per inch. Knife No. 1 is just about to begin its cut. The shaving has a feather edge where the knife first enters the wood. The arrows indicate how the board moves as the cutterhead revolves. In this particular case, the board advances ¼ in. between successive knife cuts. As a result, each shaving is ¼ in. thick (measured parallel to the grain) where the knife emerges. In one complete revolution of the cutterhead, knives Nos. 1, 2, 3 and 4 will cut the four shavings shown. Fig. 1 was purposely drawn with a deep cut and a fast feed to illustrate shaving form more plainly. In actual commercial practice, a cut 1/16 in. deep, with a feed rate allowing 10 to 20 knife cuts per inch, is much more typical. Those conditions, of course, would result in much thinner shavings than those illustrated in Fig. 1. Each shaving, however, would still have one feather edge and one relatively thick edge.

Typical planer shavings are not flat but curved or even curled at the thin edge. For this reason, they are much more bulky in proportion to weight than are standard pulp chips. In common practice the thick edge seldom measures more than ⅛ in. parallel to the grain and often much less. For this reason, pulp made from planer shavings produces a large excess of undesirable short fibers.

Part of a ponderosa pine planer shaving that has been soaked in water and then dried flat is shown in Fig. 2. Typically, the feather edge, where the cut is nearly parallel to the grain, remains relatively intact. But as the cut progresses, the knife cuts across the grain at a steeper angle producing cross grain. As a result, the thick edge of the shaving is considerably fragmented as shown. This chip was cut under conditions producing 16 knife cuts per inch, which, if anything, is fewer than usually used for such products as millwork and moldings.

Factors that affect size and shape of planer shavings

Fig. 3 illustrates the factors involved rather than standard commer-

*Maintained at Madison, Wis., in cooperation with the University of Wisconsin.

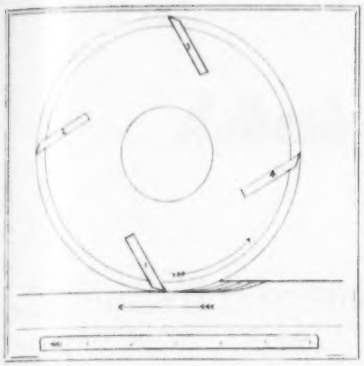

Fig. 1. Cutting of conventional planer shavings.

cial practice. Extremely fast feeds and heavy cuts in Fig. 3 show the influence of different factors more plainly. Planing ¼ in. from a 4/4 board, as in Nos. 1, 2 and 3 for instance, would be very wasteful because 1/16 in. is enough to give a smooth surface. Similarly, four knife cuts per inch would result in very poor planer work. Eight knife cuts per inch, as in Nos. 4, 5 and 6, are about the commercial minimum even in boards and dimension. In high-grade lumber, the number is more likely to be at least 16.

Samples 1, 2 and 3 all have the same depth of cut (¼ in. and the same number of knife cuts per inch (four). They differ only in cutting circle diameter. No. 1 shows the shape of shaving made by a 9-in. cutterhead, such as is fairly common in big planer-matchers. Cutterheads with a 6-in. dia. or thereabouts, as in Sample 2, are common in molders and cabinet planers. At least one high-speed molder and numerous home-workshop planers use 3-in. cutterheads as in Sample 3. These samples show that, other things being equal —the smaller the cutterhead, the shorter and fatter the shaving.

The effect of a second factor (the number of knife cuts per inch) can be seen by comparing Nos. 3 and 4. The chips are equal in length, but doubling the number of knife cuts per inch (as in 4) halves the chip thickness. This in turn increases the proportion of undesirable short fibers.

Nos. 4 and 5 are the same except for depth of cut, which is ¼ in. for the former and ⅛ in. for the latter. The effect of this reduction in depth of cut is to shorten the chips and to reduce the average fiber length.

Example 6 is the only one shown that approaches typical commercial practice. The depth of cut (1/16 in. is a normal allowance for planing one side. Eight knife cuts per inch is about as few as is often found, even in common-grade lumber. In upper grades for exacting uses, the number would usually be at least 16, which would reduce the chips to half the thickness shown in No. 6.

Experience in pulping planer shavings

Limited tests have been made at the Laboratory in pulping shaving-sawdust mixtures of Douglas-fir by the sulfate process and southern pine by the cold soda process. Results were not too encouraging. In both instances the paper was a very weak product that could only be used where strength was of minor importance. So far as the author knows, no commercial plant has ever made paper successfully in sustained operation from conventional planer shavings or from a mixture of sawdust and shavings.

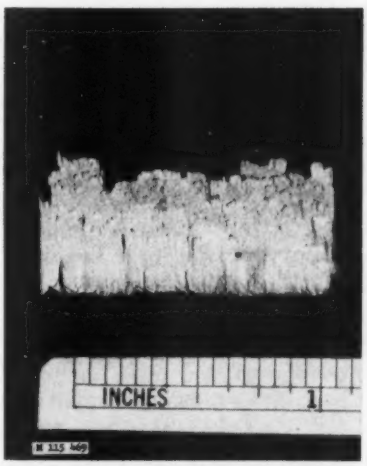

Fig. 2. Part of a ponderosa pine planer shaving.

Planer-type machines for making pulp chips

For a number of years pre-surfacers or blankers have been used here and there to size rough lumber before the final planing or to reduce roller-split by taking a light cut on both top and bottom of cupped boards. No attention was paid to the form of the resulting shavings. Within the last two or three years, three different companies have developed blankers that were especially designed to cut satisfactory pulp chips. Some of these have made good in commercial operation and are available on the market. They are not substitutes for the conventional planer, but are auxiliary equipment that removes any wood in excess of what is needed for the next operation, planing. It is fully recognized that there is no commercial incentive to cut lumber oversize in order to make the excess into wood chips. Because of the unavoidable variation in the thickness of the rough green lumber, however, nearly all of it will necessarily be somewhat thicker than the required minimum.

Chips produced by the blankers

The chips produced by blankers are not conventional planer shavings. The main difference is in the size of the bites taken by each knife. Good planing, even for common-grade lumber usually requires at least eight knife marks, or bites, per inch. With the blanker, on the other hand, a common sized bite is ⅝ in., that is, ⅝ in. parallel to the grain, not ⅝ in. deep. This is brought about by very fast feed. One of these chips would make five shavings of the eight knife-

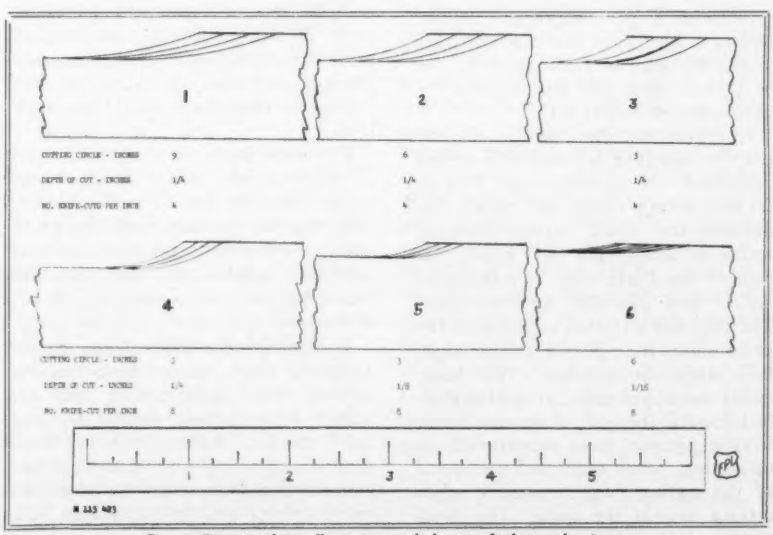

Fig. 3. Factors that affect size and shape of planer shavings.

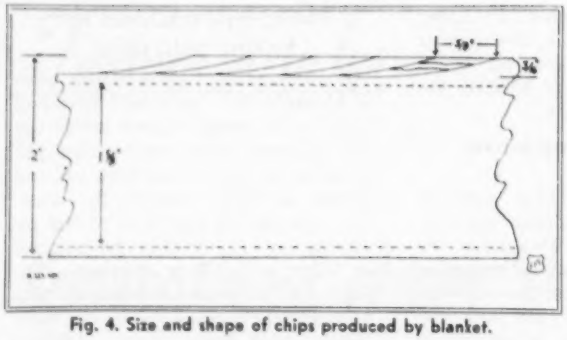

Fig. 4. Size and shape of chips produced by blanket.

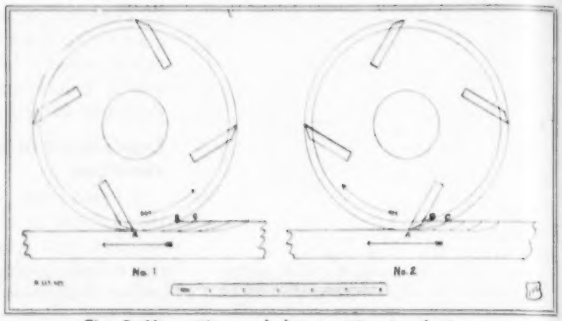

Fig. 5. Up-cutting and down-cutting in planing.

cuts-per-in. type. These large chips are much better for pulping purposes because they yield much more long fiber.

Fig. 4 shows the size and shape of the blanker chips based on the dimensions given in one advertisement; that is, lumber full 2 in. thick, making a cut 3/16 in. deep and allowing 3/32 in. for planing each side after blanking. The chips do not come out in one piece, but tend to split into two or three thinner chips under the cutting action of the knife as shown.

Big bites, such as the blanker takes, and smooth planing simply do not go together. As a result, the lumber leaving the blanker must still be thick enough to make the standard dressed size after passing through the conventional planer. If it were practical to do satisfactory planing and make satisfactory pulp chips at one operation, the volume of pulp chips in Fig. 4 could be doubled.

Two cutting techniques

Fig. 5 illustrates two different cutting techniques in planing. Up-cutting, No. 1, is the conventional method and is followed with scarcely any exceptions. Down-cutting (or climb-cutting), No. 2, is the method used in the blanker. In both cases the cut is 1/4 in. deep and the number of knife cuts per inch is two.

In up-cutting, the direction of feed and the direction of revolution of the cutterhead are opposed. AB is part of the cutting circle. BC equals the distance the board travels between successive knife cuts. AC equals the path of the knife edge in making its cut or AB plus BC approximately. The chip has a feather edge where the knife enters the cut and a thick edge, BC, where it emerges. The knife exerts more and more of a lifting effect toward the end of its cut. Slow-motion pictures have shown that, in up-cutting, splits tend to form ahead of the cutting edge, especially when cutting against the grain. The usual result is torn grain.

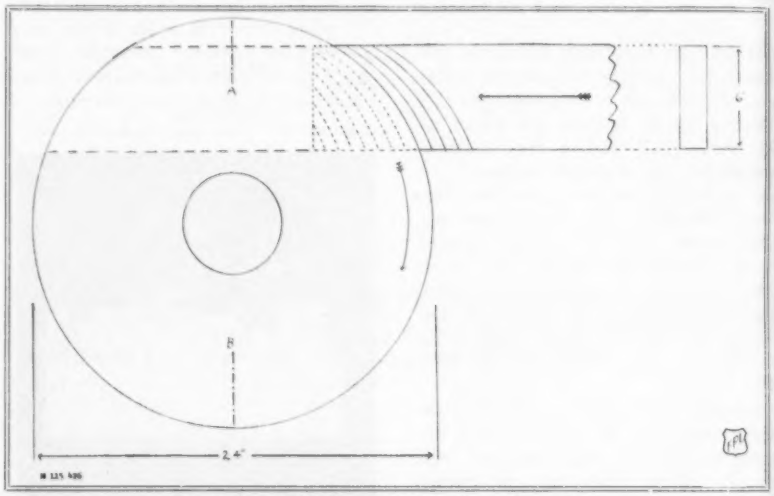

Fig. 6. Suggested disc-type cutter for making chips.

In down-cutting, No. 2, the direction of feed and the direction of revolution of the cutterhead are the same. Therefore, the path of the knife edge is AB minus BC, which results in a shorter and fatter chip, with the same depth of cut and number of knife cuts per inch. Under normal planing conditions, of course, the difference in chip shape would be much less.

Down-cutting does a much smoother planing job, other things being equal. Because the cut ends at the thin edge of the chip, with the wood under compression and in a direction practically parallel with the grain, the occurrence of torn grain is almost eliminated.

It would seem that planer manufacturers must surely have experimented with down-cutting, but inquiries to date have yielded nothing very specific. Among the apparent disadvantages are: (1) Higher power consumption because knives would do more cutting and less splitting; (2)

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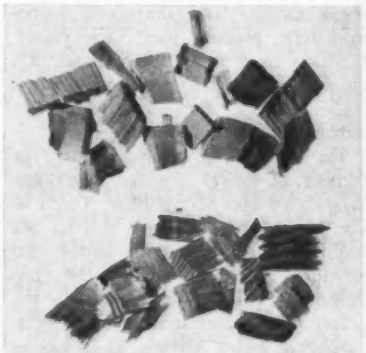


Fig. 7. Top, blackgum chip made with standard chipper. Center, Douglas-fir chips made with blanket. Bottom, ponderosa pine chips made with standard planer.

Adhesives in the paper industry

Part VII (Continued) — Heat seal and hot melt adhesives

Heat seal adhesives

Since World War II, heat seal adhesives have found numerous applications in the packaging industry. A heat seal adhesive is generally defined as one which is non-tacky or non-blocking during ordinary conditions of temperature, pressure and humidity but which becomes sticky or pressure-sensitive under the influence of heat. Such adhesives are based largely on thermoplastic resins or on waxes. They must be formulated so that they retain their non-tacky characteristics at the temperatures and pressures encountered under ordinary conditions of manufacture, transportation and storage. However, when they are subjected to a certain threshold temperature which usually is within the limits of 100 to 300° F., they become tacky or perhaps completely fluid. The application of pressure results in a bond.

In the packaging industry today, there are two types of heat seal adhesives. One of these is known as an instant tack adhesive. Here, the adhesive loses its tack as soon as the source of heat is removed. Thus, the bond formation must be brought about by the simultaneous application of heat and pressure. Still another type of heat seal adhesive, however, is formulated in such a way that tack is retained after the source of heat is removed. Thus, the heat may be applied at one station and the pressure to form the bond may be applied at another station in a packaging machine. These adhesives are known as delayed tack adhesives. Depending on how the adhesive is formulated, it may remain tacky for a few seconds or for several hours after the application of heat.

The principle of some of the delayed tack adhesives involves dispersing a solid plasticizer in a water emulsion. The inactivated film is non-tacky, since the plasticizer is not combined with the base resin. On the application of heat, however, the plasticizer is melted into the resin and is present in such concentration as to provide a sticky layer. On cooling, the layer remains sticky because it is over-plasticized.

The advantage of heat seal adhesives in labeling, bag sealing and related operations is primarily speed, which is increased several fold over more conventional types of operations such as gluing. The resulting job is usually neater. Also adhesive waste is minimized; hand labor is at a minimum; and cleaning of equipment is rarely necessary. Finally, the number of rejects are reduced.

Heat seal adhesives may be formulated from a wide variety of resinous materials. For many years, the most common were waxes. These had the advantage of low temperatures of operation, for waxes melt considerably below the melting temperature of most synthetic resins. On the other hand, waxes tend to block and they are quite brittle, which harms their barrier properties. Improvements are observed when resins, such as nitrocellulose, cellulose acetate, ethyl cellulose, polyvinyl chloride-polyvinyl acetate copolymers, polyvinyl acetals, polyamide resins, rubber derivatives and asphalts are used as the bases for heat seal adhesives.

Heat seal adhesives may be applied by various procedures. One of the common methods is from hot melt. Here, the adhesive is simply melted and the melt is coated onto the substrate. However, the most widely used means of applying adhesives of this nature is from solvent solutions. Water dispersions, however, are also used.

Once the heat seal adhesive is applied, it must withstand blocking at high temperatures and high humidities. This is important if stacks of labels or rolls of paper, coated with the heat seal adhesive should have a broad sealing range to take care of variation in machine temperature. It should provide a bond with good tensile strength, as compared to the strength of the substrates being sealed, and this bond should be stable — i.e., it should not lose its strength on storage under a variety of conditions.

Procedures for evaluating heat seal adhesives have been described by Wittcoff and Peerman (11).

Cellulose nitrate, compounded with wax, plasticizers and resins, provides a useful moisture-proof coating which is also heat sealing. Cellophane of the type used on cigarette packages is frequently coated with such a material. Where flammability of the cellulose nitrate prevents its use, cellulose acetate or cellulose acetate butyrate may be used. Ethyl cellulose, which is a very tough resin with good low temperature flexibility, may be an important constituent of heat seal adhesive formulations. It is particularly valuable because of its broad compatibility ranges, which makes compounding relatively easy.

Polyvinyl acetate is an important base for heat seal adhesives but usually must be compounded to reduce its tack and brittleness. The addition of polyvinyl chloride to a heat seal adhesive formulation improves solvent resistance. Vinyl chloride and vinyl acetate copolymers are useful especially where coatings are desired which also have heat sealing properties. The polyvinyl acetals, such as polyvinyl butyral, possess inherent heat sealing and elastic properties which make them valuable. Where an extremely high degree of adhesion is required, rubber and hydrocarbon polymers may be used as the base for heat seal adhesives. Hydrocarbon polymers are frequently used in the so-called delayed tack type of products.

Heat seal adhesives are bonded in a variety of ways. A simple hot iron can be used for hand operations. For machine labeling or packaging, hot sealing jaws are employed. Induction heat sealing equipment is available espe-

(Continued on page 32)

Clarifying high-color, low-turbidity water

E. A. STRAHLENDORFF

Manager, Industrial Water Treatment
Graver Water Conditioning Co.

Part I – Clarifier design and operating conditions

HC-LT waters, with average water impurities of 30-100 ppm and average turbidity values of less than 20 ppm, are satisfactorily handled in high-rate clarifiers even under varying conditions of flow.

ONE of the most common and difficult water treatment problems is the clarification of high-color, low-turbidity water (henceforth referred to as HC-LT). These waters, found in the South-East, New England and other parts of the United States, have average color impurities of 30 to 100 ppm rising to maximum values of 500 ppm and more. Their turbidity averages less than 20 ppm, often running as low as 5 to 10 ppm for months and then rising briefly during rainy periods to values of 100 ppm and more.

HC-LT water is most often found in areas with abundant forestation. Paper mills using these supplies must reduce the color content of the water to very low levels, especially when making high-brightness papers. Values generally required are less than 5 to 20 ppm color and less than 5 to 10 ppm turbidity. If certain conditions of chemical selection and equipment design and operation are met, water of this quality can be consistently produced from HC-LT supplies.

The problem

HC-LT waters produce a very light floc when treated, and this light floc is often carried over into the effluent rather than settled out. The materials that cause color are in large measure responsible for this light floc, but another factor is the low-turbidity condition of HC-LT water. If color impurities were carried in high-turbidity waters they would be more easily removed with the heavy turbidity which settles readily. The fact is that low turbidity, which does not settle readily itself, will not encourage settling of other impurities such as color.

Another aspect of the problem is that color occurs in two forms (1) suspended particles which settle and are filterable, and (2) dissolved which are dissolved and cannot be filtered out. The dissolved color must be precipitated by chemical reaction or oxidation before it can be coagulated and settled out of the water. Chemical treatment to precipitate dissolved color can be difficult, sometimes requiring unusual combinations of chemicals and always careful control of feeding. Chemical feeding is complicated by the fact that the type of color frequently varies in HC-LT supplies and this may require a change of chemical treatment.

Closely allied with this problem is the fact that color imparted by organic material is not generally electrolytic and therefore not responsive to polyelectrolyte chemicals. One of the functions of chemical treatment is to impart an electric charge on the organic material.

Sometimes, oxidation alone is sufficient for removing color from HC-LT water. However, complete treatment with some type of settling equipment is usually required. The best all-around method for dealing with this problem is high-rate clarification which has been found effective in numerous installations. The important considerations in high-rate treatment of HC-LT supplies are chemical selection, chemical feeder design and the design of the high-rate machine.

Chemical selection

There are several types of chemicals to choose from for treating HC-LT water:

1. Coagulants — alum, sodium aluminate, ferric and ferrous sulfates.
2. pH adjusting agents — lime, soda ash or caustic soda.
3. Oxidizing agents — chlorine or chlorine dioxide.
4. Coagulant aids — activated silica, Separan, hydroxyethylcellulose, Nalco 600 and others.
5. Weighting agents — clay, cal cite flour.
6. Adsorbents — activated carbon.

Economic or process factors may exclude the use of some of these reagents. Practical experience with coagulation of HC-LT waters in modern high-rate sludge recirculation machines shows that, generally, the chemical selection can be limited to a few of the above such as: (1) a coagulant, usually alum but occasionally an iron salt; (2) a pH adjuster, such as lime or soda ash; and (3) a coagulant aid, such as activated silica or Separan.

For a very highly colored water that produces an extremely light floc, a

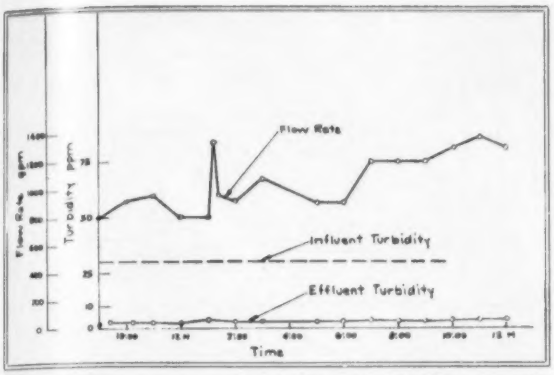


Fig. 1. Performance curve of a clarifier at a Virginia paper mill.

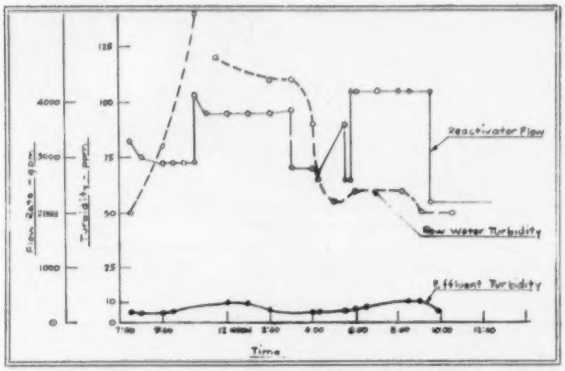


Fig. 2. Performance curve of a clarifier at another paper mill.

weighting agent such as clay is helpful. Sometimes the combination of two coagulants such as alum and sodium aluminate can provide better coagulation than an equivalent dosage of either one by itself at the same pH. The alkaline sodium aluminate can eliminate the need for feeding an alkali solely for pH adjustment.

Thorough laboratory and field tests must be made to find the optimum chemical treatment and to give an indication of settling rates of flocs formed by these chemicals. Jar test procedures have been well covered in the literature; additional information on them can be obtained from equipment manufacturers. Although results from jar tests run in laboratories remote from the job site will give a good indication of possible treatments, tests properly conducted at the site are often more reliable since there is no chance for the sample to change in character before treatment.

Five-gallon samples are recommended for each series of tests. A supply of all the chemicals mentioned above should be at hand, preferably in a jar test kit. The laboratory equipment, in addition to the usual glassware, should include a variable speed multiple stirrer. Jar test records should be kept in an accurate and methodical manner. Equipment manufacturers can be helpful in furnishing sample data sheets.

Experience of other plants

Laboratory or field test results are of invaluable assistance as guides in designing the clarifier. However, the backlog of experience on the physical limitations of high-rate clarifiers when treating these waters should also be considered. It is here that the experience of the consulting engineer and equipment manufacturer can be used to good advantage. Skill in properly interpreting jar tests as well as knowledge of the relationship between laboratory tests in beakers, field tests in pilot plants and full-scale plants will ensure that the proper amount of caution is observed in establishing the design criteria of a high-rate clarifier.

Additional factors to consider that do not show up in the laboratory, or often even in pilot plant studies, are the degree of operator skill available and seasonal or even daily variations in the chemical composition of the water being treated. It should be remembered that a unit designed too small or installed without the mechanical refinements that have proved effective in obtaining the best results, can be changed in the field only at great expense, if at all.

Clarifier design

Good chemical mixing and good floc formation through the contact of water with accumulated sludge are important considerations in the design of any high-rate machine for HC-LT waters. Chemicals may be added to flow-splitting basins (which often precede multi-unit plants) or in many cases may be added directly to the units. The order of addition of chemical reagents to the water can often be important in obtaining the best color reduction. It is therefore advantageous that the system be designed so that chemicals can be added either to the water before it enters the clarifier or directly to the machine.

When the chemicals are added directly to the clarifier, they should be added at the point where they disperse immediately in a mixture of water and slurry. Jar test results will generally indicate whether there is an advantage to be gained by adding one reagent ahead of another. If the design is flexible, the points of addition for various chemicals can be variable even while the unit is in operation, should the water composition change seasonally. Manufacturers of clarification equipment have generally incorporated some mixing provisions in their design, though not all provide for sludge recirculation.

Floc formation should occur in a separate and physically distinct zone of the clarifier. If there is some sludge outside of the flocculation zone which contacts the water rising to the collection system, this adds to the total floc contact time. When treating highly colored waters, this contact time should be about 20 to 40 min. However, since highly colored waters of the type under discussion often produce very light and hard-to-settle flocs, it is also desirable to keep the sludge level in the machine as low as possible. This is especially true when the machine is subject to any rapid rate variations. The lower the sludge level under these circumstances, the less the possibility of carrying the light sludge up as high as the collection system.

Total detention time in the clarifier, including mixing and floc forming zones, again is subject to some variations depending upon a particular supply, but in general it should be at least 100 min. and in some cases as much as 180 min. The latter, of course, would be where waters are often extremely colored (500 ppm or more). When treating HC-LT waters, it has been found advisable to keep rise rates conservative, generally at about 1.0 gpm/sq. ft. There have been plants operated at 1.5 gpm/sq. ft. and above which have provided water satisfactory for plant requirements but these were cases where color was generally moderate, not above 50 ppm.

Adequate and positive handling of excess sludge formed in high-rate clarifiers is another important design

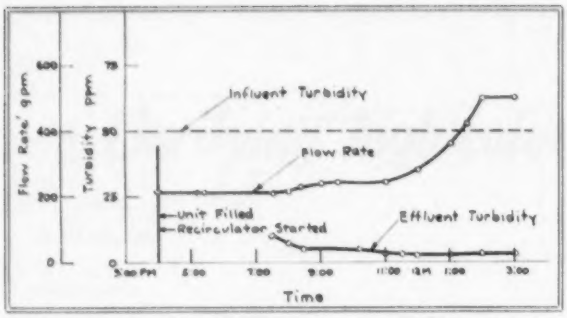


Fig. 3. Start-up performance curve for a midwestern refinery.

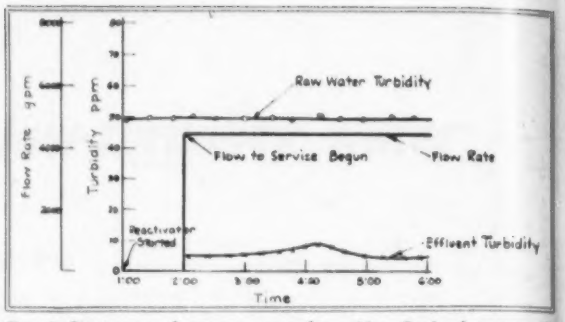


Fig. 4. Start-up performance curve for a New England paper mill.

consideration. The designer should be sure that the sludge removal system incorporated is adequate to keep the machine from becoming "chocked" with accumulated slurry and thus carrying the slurry over to the collection system. Sludge should be collected uniformly from all parts of the machine. The rate of sludge removal should be variable in a reliable manner to allow for more or less rapid blow-off rates. Rate of blow-off is generally controlled on an adjustable time cycle although where the floc rate varies considerably, it can be tied into the flow meter so that the control is directly proportional to the flow rate.

Three special operating conditions

Beyond meeting normal operating conditions, high-rate clarifiers for HC-LT service should be able to handle certain special conditions. These are:

1. Variations in flow. Ability to handle rapid rate variations, often called surgeability, is a desirable characteristic of high-rate clarifiers, particularly on high-color service. Figs. 1 and 2 show the type of results required. In Fig. 1, which is based on results obtained at a Virginia paper mill, flow rate was increased almost instantaneously from 850 to over 1300 gpm and then reduced to 950 gpm within a period of 30 min. There was practically no effect on the clarifier's effluent turbidity as a result of this rapidly changing flow rate.

Fig. 2 shows results obtained at another Virginia paper mill where both the flow rate and the influent turbidity varied widely over a very short period of time. As the flow rate was increased from 3000 to 4000 gpm, the turbidity increased from about 75 ppm to more than 150 ppm. The effluent turbidity from the machine increased over a period of 60 to 90 min. from 5 ppm to about 10 ppm, then over the succeeding 2 to 3 hrs. returned to the normal value of 5 ppm. The curve also shows that later during the same test the unit was surged from a flow of about 2700 gpm to over 4000 gpm and was held at this high flow rate for more than three hours. The raw water turbidity remained relatively constant at about 60 ppm. The effluent turbidity increased gradually in the first 3 hrs. from 5 ppm to 10 ppm but then fell back during the next hour to the normal value of 5 ppm.

These results demonstrate what is meant by surgeability: regardless of wide load swings even in combination with substantial turbidity variations, the equipment should be able to produce about the same quality effluent during and immediately after the period of change and should also show a rapid return to prechange performance.

2. Fast equilibrium from zero flow. A unit periodically subject to startup from zero flow needs to reach equilibrium quickly. Since high-rate machines depend upon intimate contact with previously formed sludge as an important factor in their operation, the faster the previously accumulated sludge can be distributed through the floc zone, the faster the unit will produce desired quality water. Fig. 3 shows results that can be obtained for this type of condition. At 4:00 p.m. on the graph the unit was filled and the recirculator started. The influent turbidity remained constant at 50 ppm. Flow was set at 200 gpm. Four-and-a-half hours after startup, effluent turbidity showed a value of less than 10 ppm. This value fell to approximately 5 ppm within one hour and did not rise above this low figure even though the flow rate was increased from 250 gpm to 500 gpm over a period of 4 hrs. When operating at 500 gpm the unit was performing at approximately a 2.0 gpm/sq. ft. rise rate.

3. Restart when full. A similar operating condition which a high-rate clarifier may be called upon to handle is a restart when full, as after a weekend shut-down. The second curve in Fig. 4 illustrates the performance that can be obtained under this condition. The recirculator was started approximately one hour before flow to service began. Influent turbidity remained constant at 50 ppm. Effluent turbidity, after flow to service was commenced, rose gradually over the next 2 hrs. from an average value of 5 ppm to a maximum value of approximately 10 ppm and then returned to the low value of 5 ppm in the following 2 hrs.

Other factors

Temperature Effect. The performance of all high-rate machines is adversely affected to some degree by varying water temperatures. This temperature effect can be due to upstream variations in the inlet water temperature caused by heat exchange equipment. Whatever the reason, the temperature in the clarifier should be carefully controlled. Graver experience indicates that a safe variation is no more than 1° F. in 60 min. Variations caused by the effect of the sun on the water supply, as in a shallow stream or on the surface of the clarifier itself, can produce "boil-ups" with sludge rising to the surface in spots. "Boil-ups" can best be minimized by carrying the sludge level as low as possible in the machine. However, it must be recognized that this condition requires somewhat closer attention and may necessitate adjustment in chemical feeds, blow-off rate or agitator speed, or special field arrangements. For example, in a recent case it was found that covering an area of the clarifier with an aluminum sheet eliminated "boil-ups" in that area.

(Continued on page 32)

Duroid strip is shaved down to desired thickness.

Filler pieces of Duroid are driven into position.

Paper filler pieces in jordan plugs

The superiority of a paper machine product over wood as filler pieces in stock preparation equipment has been demonstrated in mill operations.

The idea of replacing wood to lock jordan plug bars in place dates back several years ago when E. D. Jones Corp. of Pittsfield, Mass., was looking for an improved material for its new line of jordan plugs.

Numerous materials were checked, including new forms of wood-fiber compositions and plastic laminates. The material that, after exhaustive testing, was found to be superior in this application is a cellulose fiber-plastic resin product. It is made by Rogers Corp. of Rogers, Conn.

It was developed originally as electrical insulation under the name of Duroid 800. It is made by the beater addition method in sheets 60 in. by 66 in. and .031 in. to 3 in. thick.

Among the outstanding properties of Duroid 800 which made Jones engineers select this material over plastic laminates and other materials are: (1) its compression strength of 35,000 psi and (2) its rate of water absorption which, while slower than that of wood (20 per cent after 24 hr.), is more than adequate for its use in this application.

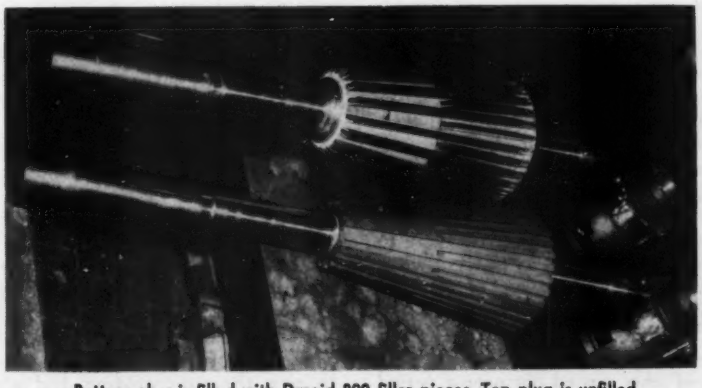
Duriod 800 can be turned, beveled, planed, routed, etc., on woodworking machinery, almost as easily as wood itself. In addition to these qualities, the material is stronger when wet than when dry, which is a characteristic that sets Duroid 800 dramatically apart from wood. Alternate exposure to wetness and dryness does not cause deterioration in Duroid anywhere near as rapidly as it does in wood.

In addition, the fiber-plastic material offers far greater resistance to the extremes of temperature and acid-alkali conditions encountered in fiber processing.

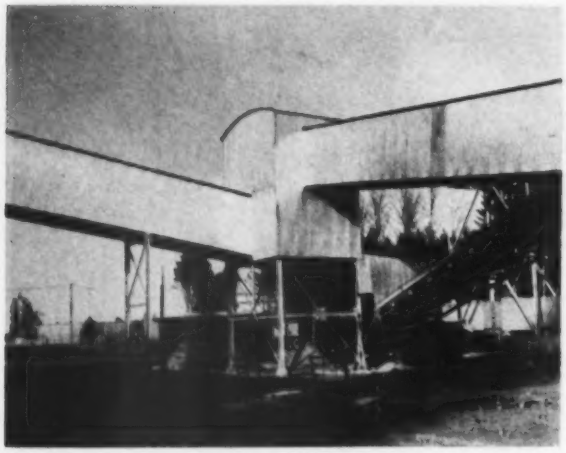
Duroid 800 filler pieces wer specified first for the Jones Adapta-Plug, introduced in 1955. Rogers supplies the material in the form of laminated strips measuring .286 in. to .296 in. thick, ½ in. wide and 66 in. long. Filler pieces are fabricated in the Jones plant. Fabricating operations consist of cutting the strip to length, beveling one end and the underside of that same end, and then shaving the piece to desired thickness on a sizing pointer.

An almost incidental advantage determined during fabrication is that Duroid filler pieces can be sized to within ± .003 in. of the required thickness, an accuracy not possible

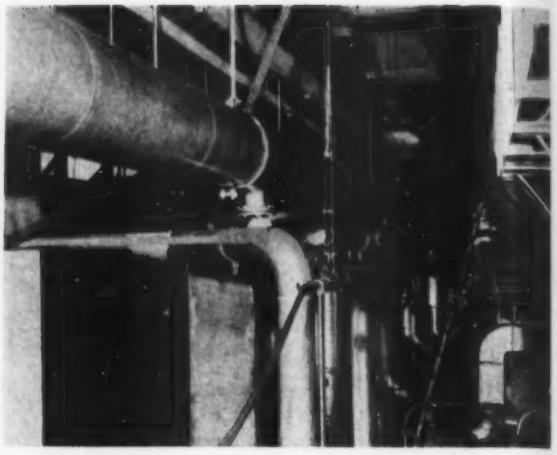
(Continued on page 30)



Bottom plug is filled with Duroid 800 filler pieces. Top plug is unfilled.



The aluminum conveyor system housing provides corrosion-resistant and light-weight structures.



The 18-in. aluminum main line and various diameter branch lines.

Sulfate pulp mill uses aluminum in its water-supply system

THE USE of aluminum as a construction material presents an economic advantage in eliminating dead weight and reducing corrosion, high maintenance, and high labor costs.

Needless to say that paper and pulp mills have kept pace with their continuous research in the utilization of lighter and more resistant materials and today are using more and more of this silvery metal.

One such mill is the sulfate pulp mill of the Crofton Pulp Division of British Columbia Forest Products. Here water contamination was a major problem and the engineering department specified aluminum piping to handle the mill's water supply. This mill now has over 4,500-lineal feet of aluminum piping, ranging in size from 3 in. to 24 in. in diameter. The main fresh water supply main leading to the mill is 24 in. in diameter. This main was manufactured and installed on the job, at an estimated saving to the company of over 35 per cent when compared with the cost of stainless steel or other suitable materials.

The choice of aluminum was not a pig-in-the-poke selection, but the result of tests carried out over a period of years in British Columbia pulp mills — all of which definitely proved that aluminum is an excellent material and that savings in weight, ease of installation and corrosion resistance are important economic factors.

The water main running through the mill is 18 in. in diameter and tapped from the 24-in. supply main. The main in the plant has 16-in. and 10-in. branch lines. The inside 18-in. main carries all of the necessary fresh water for the pulping building. Insulation between the aluminum pipe and its steel hangers is rubber stripping, eliminating wear and also acting as a protection against electrolysis.

The piping designs were carried out by the consulting engineering firm of H. A. Simons Ltd.

All piping up to 8 in. in diameter, was made from Alcan 50SF alloy; piping from 8 to 24 in. in diameter from one-quarter-in. plate of Alcan B54S and other alloys.

The simplicity of the pipe manufacturing and installation was such that local firms were able to do the job without difficulty, which included the rolling of the aluminum sheets into pipe, the seam welding, and when necessary even the welding of the flanges onto the pipe ends on pipes between 3-in. and 10-in. and more. The reducing bends or elbows were constructed, in the lobster back form, from ¼-in. Alcan B54S alloy plate, cut and welded on the job.

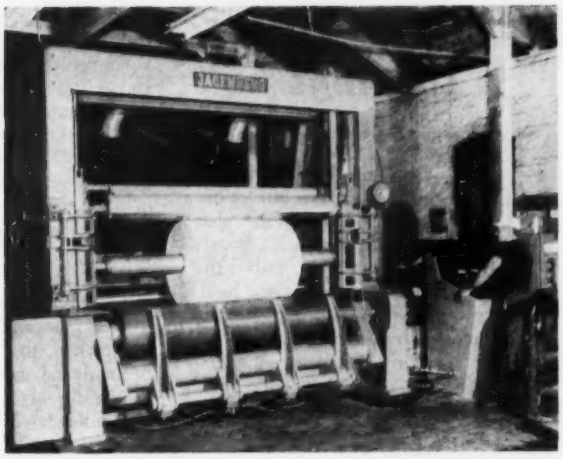
All field welds were made by the argon system, using argon-tungsten arc equipment, and all flanges were bolted together by cadmium-plated bolts and nuts. All butt-welding was actually done on the mill site.

Crofton sulfate pulp mill went a long ways further than just installing aluminum pipe in their mill. Over 60,000-lb. of Alcan "Utility" sheet were used for the entire ventilating and air-conditioning system, and over 65,000-lb. of Alcan industrial sheet to house the entire conveyor and mechanical handling system. The use of this lightweight material made it possible to save thousands of pounds of structural steel in the construction of lighter structural members to support the conveyor system housing.

Light-weight, attractive appearance, low maintenance costs, good corro-

(Continued on page 70)

Westvaco installs first pneumatic winder



Jagenberg pneumatic winder, showing pneumatic gates for unwind shaft and roll lowering device.

INSTALLATION and start-up of the first Jagenberg pneumatic winder in an American paper mill has just been completed at the Tyrone, Pa., mill of West Virginia Pulp & Paper Co.

Representatives of the American Paper & Pulp Co., Inc., of New York, distributors of the German-made equipment, said the winder is the first of its type to be installed in this country, although more than 100 winders of this design are currently in operation throughout the world.

Westvaco's Tyrone mill also is operating the first Jagenberg mill-type sheet cutter and first multi-shear slitter system in this country.

The winder has a trimmed width of 80 in. and can unwind from parent rolls up to 88 in. wide. It can slit webs down to 4 in in width, run up to 4000 fpm and has a maximum rewind diameter of 60 in. At Tyrone the equipment is being used as a rewinder for slitting envelope grades into narrow rolls as well as for general salvage work on Tyrone's entire line of coated and uncoated papers.

Special features of the winder

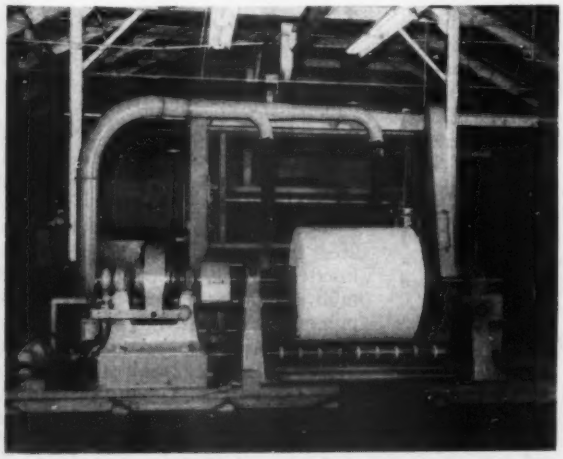
The pneumatic winder features a motor-operated adjustable unwind with oscillating mechanism. Constant web tension is maintained by a dancer roll type tension control.

Slitting is done by the "Multi-Shear" slitting system which combines the clean cut of the rotary shear with the setting ease approaching that of a score cut, one of the unique features of this equipment. Since the slitters are located very close to the wind-up, the spreader bar is ahead of the slitters rather than behind it. The rewind shaft is not held by brackets, but guided within hardened steel channels, the front member of which swings open like a gate. The winder does not require a separate lowerator, as a cradle-type lowering device is built into the machine. To vary the winding hardness and to enable soft windings when necessary, the Tyrone winder features a special shaft counter loading device.

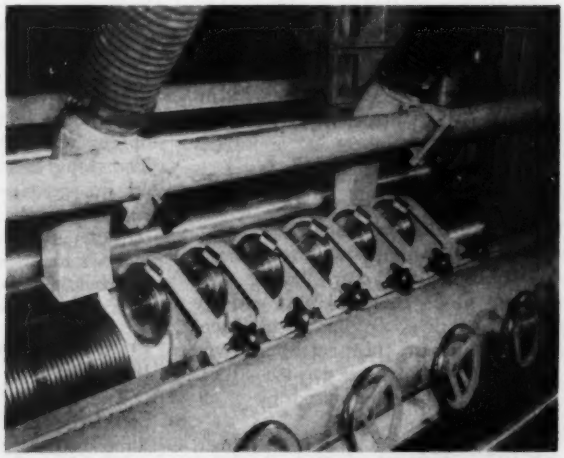
All operations of the Jagenberg pneumatic winders other than the drive are performed by air. The air-operated features include: the unwind brake; tension control; air jets for threading slitter engagement; shaft counter loading; riding roll counter loading; roll ejector; and roll lowering device.

Another unique feature of the equipment is that all fly rolls on this winder are driven.

While the installation at Tyrone is too recent for final evaluation, clean straight sided rolls have been produced to varying degrees of winding hardness in accordance with Westvaco's specifications.



Rear view shows adjustable unwind stands, oscillator and water cooled brake.



Spreader bar with "Multi-Shear" slitters and trim suction.

Pulp from planer shavings

(continued from page 22)

more rapid dulling because knives enter the wood on the surface that would have the dust and grit, if any; and (3) a tendency to "grab" the lumber, unless it is very firmly held, and throw it. As far as we know, the only machines now using down-cutting are certain automatic shapers, which employ compressed-air hold-downs for the lumber.

Fixed knife planers

Planers of the fixed-knife type are often used in northern Europe, most commonly in the Scandinavian countries. In general, the fixed knife appears to be losing ground to the round cutterhead equipped with thin knives.

Typically, the fixed knife does not do the whole job; it merely removes a predetermined amount from the lower side of the lumber. The same machine also has one or more revolving cutterheads in addition. These plane the top and edges, removing any excess above the desired final size. Some of the larger machines may have as many as three fixed knives, all held in the same removable knife-stock. The shavings produced by the fixed knives resemble hand-plane shavings much more closely than cutterhead shavings. They usually go to the hog along with certain other residues and the chief use is for fuel.

One American company makes a fixed-knife machine that deserves mention although it is not a planer. This is called a wood-scraping machine. The knife, which is held in a stock, removes a continuous shaving from 0.001 to 0.006 in. thick. The machine is used for furniture, desks, tables, and plywood and hardwood flooring, and takes the place of hand scraping for both solid wood and veneers. It is made in five widths from 15 in. up to 69 in., and feeds at 85 fpm, or about twice as fast as is customary with drum sanders.

Rotating disk planers

Possibilities have not been completely overlooked for planing with rotating disks equipped with radially arranged knives on one face. Theoretically at least, chips cut by this type of cutter should have decided advantages over those produced by a rotating cutterhead.

Holztechnik describes a German "Turbo Smoothing Planer," which has knives mounted on a circular disk operating in a horizontal plane below the work as in a jointer. It can make a cut as deep as 0.5 in. Advantages claimed are very smooth surface, silent running and low-power requirements. The maximum width of material that can be planed is not stated, but evidently it is a little less than the radius of the disk. This might increase the width of the machine to an undesirable degree in planing anything wider than 12 in. As pictured, this machine is a type of hand-feed jointer rather than a planer, but if this type of cutter proves to be practical, it could probably be used in a planer as well. In the absence of further information, it should be classed as new and untried.

At least one American machine has used the rotating disk cutter successfully—a flooring machine, now discontinued. Cosgrove's Handbook describes the machine operation as follows: "Stock is run on edge between vertical rolls and is cut by a new type of disk head which is very slightly cone-shaped. The disk has two types of knives, one for roughing and one for finishing. The disk revolves in a vertical plane and all cutting is done on the upward-traveling arc of the disk. The knives shear across the vertical face of the stock. No sanding or scraping is required."

These machines, according to report, are still operating in three or four plants in different parts of the country. What disadvantages led to their being discontinued are not known.

Fig. 6 illustrates the sort of chip that could be made by a disk-type cutter operating in a vertical plane. As has been pointed out, the usual type of rotating cutterhead makes chips that are thin at one end and thick at the other. In this disk-type cutter, knives A and B would cut chips of uniform thickness throughout, which should be an advantage. The chip dimension parallel to the grain could be governed by changes in the feed rate, and the quantity of short fiber could be minimized. Depth of cut would be subject to control. The chips, of course, would not come off in one piece, but would split as cut into several smaller pieces. Theoretically at least, such a cutter could make satisfactory pulp chips and a smoothly planed surface at the same time.

Preferred size and shape for pulp chips

The size and form of chip that is preferred for pulp and paper varies somewhat, depending upon the kind of wood and the chemical process that is to be followed. Fig. 7 (top) shows fairly typical pulp chips of black gum made with the standard chipper. The chip is short enough and thin enough to allow complete penetration of chemical during the normal cooking period. At the same time, the chip is long enough to give a satisfactory yield of the long fibers that are essential to good tearing strength in the end product.

Fig. 7 (center) shows Douglas-fir chips as made by a blanker. In these chips the direction of cut is much more nearly parallel to the grain than in the black gum chips above. These Douglas-fir chips are reported to have given good satisfaction in use.

Fig. 7 (bottom) shows ponderosa pine planer shavings of fairly typical size. The object here was to produce a smooth surface on the lumber without regard for the subsequent utility of the shavings. All of these shavings are curled at the thin edge where the direction of cut is nearly parallel to the grain. At the thick edge, they are more or less broken into short fragments or fines of no special utility.

Paper filler pieces

(continued from page 27)

with wood and a refinement that is an aid to assembly.

With some four years of performance supporting the experimental evidence of the superiority of Duroid for filler pieces, Jones engineers have been gradually expanding the areas in which this material is applied. It is now being used in refiner shell fillings that are to be employed under conditions where high temperatures prevail and/or where the stock contains a high percentage of abrasive contaminants.

Field tests demonstrate that Duroid withstands temperature conditions and abrasive contacts that quickly deprive wood of its strength.

Wedges of Duroid are now also used to secure the defibering blades inserted around the periphery of the high speed rotors on Jones Hi-Lo pulpers. In this instance, too, the compressive strength, water absorption properties and extremely tight fit afforded by Duroid results in wedges that lock tightly and hold tightly—a vital asset considering the fact that the surface speed of the rotors is in excess of 5,000 fpm.

Paper manufacturing leads in the use of radioisotopes

AMONG the twenty major American industrial groups utilizing radioisotopes, the paper industry leads all the rest in applying nuclear science for industrial purposes, according to a study made by the National Industrial Conference Board, New York. The study of industrial uses being made of radioisotopes was undertaken by the board under contract with the U.S. Atomic Energy Commission.

In a twelve-month period in 1957 to 1958, 99 companies in the paper and allied products industry reported the use of radioisotopes, of which 93 supplied usable savings data, indicating that during the year of the census most of them were enjoying a good return on their investment. More than 75 per cent of the total of $2,818,000 saved in the paper industry came from the use of radioisotope thickness gauges to control basis weight and thickness of coatings, such as adhesives and polyethylene film and of various laminated and impregnated paper products. Radioisotopes also are used by the industry to control the level of pulp slurries in digesters and bleaching towers and to measure the density of clay slurries and solutions.

Of the total of almost $3 million savings realized by the industry through the use of radioisotopes, thickness gauging accounted for the greatest proportion, $2,254,000. These savings result in part from a decrease in scrap and waste and in part from a saving in raw materials. Despite these monetary benefits, many paper companies say that the most significant result of radioisotope use in their industry is the improved quality of paper products and the resultant improvements in customer relations.

Monetary benefits

Monetary benefits have accrued to two thirds of the mills that reported employing radioisotope gauges to measure and control basis weight. In some cases, the savings were quite substantial. For example, one company that formerly checked basis weight by sample cutting and weighing saved $50,000 annually on reduced scrap with a radioisotope gauge. The cost of switching to radioisotope gauging was only $2,000 a year. In another case, a manufacturer of book paper formerly lost 1 per cent of his total production to scrap because of weight variation. The virtual elimination of this waste is saving him $112,500 a year. The gauge cost only $5,000.

In addition to reducing scrap, radioisotope gauges have also reduced substantially the consumption of raw materials in some mills. A manufacturer of kraft paper realized an annual savings of $25,000 on raw material with a radioisotope gauge that recorded and controlled the basis weight of the paper within a tolerance of plus or minus 1 per cent. He previously controlled basis weight by cutting and sampling and put more material than was necessary into his products to meet minimum requirements. A producer of asbestos paper, who previously used a continuous weighing scale to determine basis weight, saved an estimated $50,000 in raw materials with a radioisotope gauge that controlled the product within a tolerance of plus or minus 5 per cent.

Another source of dollar benefits provided by radioisotopes and associated controls is the increased productivity that results from such factors as the more rapid change to a different basis weight, the freeing of operators to give their attention to other operations and the lessened down time for hand sampling. About one third of the mills studied reported such savings. An increase of 2 to 5 per cent in productivity gave one company an annual saving of $65,000 on 400 million lineal feet of production. Another company increased productivity only 0.5 per cent but saved $37,000 on 140,000 tons of output.

Generally speaking, no saving in direct labor cost resulted, since the same number of employees was required with or without a gauge. However, the time of test personnel can be saved when a radioisotope profiler gauge replaces balance weighing in the control laboratory to measure samples. Radioisotope gauging was reported to be from six to fifteen times faster than weighing on a balance, a saving that permits test personnel to devote themselves to other jobs. More commonly, however, the number of tests is increased while the number of test personnel remains constant.

Adhesives

(continued from page 23)

cially where thick, non-conducting areas are involved. A great deal of progress has been made in the development of automatic heat sealing machinery, which has encouraged the use of these types of adhesives in lamination, splicing of fibers and fabrics, and in the industries which convert papers and films as well, of course, as in labeling. Heat seal mending tapes which stand up during dry cleaning and washing are another application for these adhesives as are heat-activated transfers and decalcomanias.

Blister and skin packaging makes use of heat seal adhesives. In one procedure, the paperboard is coated with a heat seal adhesive which is, of course, non-tacky. The article to be packaged is later sealed between the blister and the coated paper by application of heat and pressure. In this instance, the adhesive must, of course, adhere not only to the paper but also to the plastic film which is used to form the "blister".

Hot melt adhesives

Hot melts comprise still another form in which synthetic resins may be used. Here neither solvent nor water is present and the adhesive is applied as a thin film simply by melting it and heating it to a viscosity proper for application.

Hot melt adhesives are attractive because they represent economy through the elimination of solvents. Among the advantages of hot melt adhesives are the easy control of film thickness on application and the ability of the adhesive to be adapted to high-speed operations. The hot melt adhesive must have the property of being liquefied by the application of heat. Once the heat is removed, the adhesive becomes solid. A good hot melt adhesive becomes sufficiently liquid on the application of heat so that it can be applied readily by the normal manual or mechanical means for applying adhesives. Waxes are, of course, excellent examples of low-melting, hot melt adhesives. A wide variety of resins also form the basis for hot melt adhesives, including cellulose derivatives, asphalt, polyethylene, certain vinyls, polyamides, and others. All of these materials are, of course, thermoplastic.

Hot melts are usually formulated with the basic resin combined with tackifying resins, plasticizers and waxes. Those based on waxes melt at relatively low temperature and are easy to use. Where high molecular weight resins are employed, the melting points are considerably higher and operation is correspondingly more difficult. However, the films are tougher and demonstrate a better adhesion and flexibility than do the waxes.

Hot melt adhesives are used in laminating, coating and heat-seal operations for can labeling, tear tapes, milk container manufacture, tube winding and for heat-seal coatings for board stocks and for blister and skin packaging.

A great deal of confusion exists relative to the distinction between hot melt and heat seal adhesives. The two terms are by no means synonymous. The point must be borne in mind that hot melt adhesives are those which are formulated completely without volatile materials such as solvents or water. Rather the adhesive is one which can be put into a form for application to substrates simply by melting it. Subsequently, after the film has been applied and solidified, it may be heat sealed to another surface by the application of heat. However, a hot melt adhesive, once applied, may also be caused to form a bond by the solvent response procedure already discussed.

Hot melt adhesives are widely used in such operations as laminating, particularly where paper is to be laminated to various plastic films such as cellophane or to foils or to other cellulosic materials. Asphalt hot melt adhesives are used extensively in making laminated bags and board stocks whereas wax hot melts are used to bond paper boards and glassine.

Blister and skin packaging referred to above may make use of hot melt adhesives for the heat sealing layer on the board. The pickup gums used in the food processing industry in the labeling of cans are hot melt adhesives. The pickup gum serves to make a loose bond between the label and the container until the label is in its final position on the can.

Related to pickup gums are spot label adhesives which pick up a label from a stack and apply it to a substrate. Here, however, the spot label forms a permanent bond.

Milk cartons and frozen food packages are examples of packages which can be formed with the aid of hot melt adhesives.

Specialized machinery has been developed for melting and applying hot melt adhesives in order to take advantage of the high speed, lack of volatile materials, and quick set which these adhesives make possible.

One of the recently interesting developments in hot melt adhesives is the formulation of these materials in the form of ribbons wrapped in coils. The ribbons are then fed automatically into a machine where they make possible rapid operation with a minimum of waste and subsequent need for clean-up. Adhesives of this type have been developed which bond kraft paper, polyethylene coated papers, polyethylene film, aluminum foil and waxed papers.

Clarifying water

(continued from page 26)

Corrosion Protection. Treatment of HC-LT water often means operation at a pH below 7, sometimes as low as 5. Corrosion of steel shells and internals at such a low pH can be a problem. The designer must consider adequate protection for the units and he should consult qualified engineering firms and equipment manufacturers for their experiences in protecting against corrosion in coagulation machines operating on similar waters. Coal tar base paints and enamels have often been successful in preventing corrosion at low pH. However, good maintenance and upkeep is still required to maintain the equipment's appearance as well as to prolong its life. The equipment should be shut down once a year for inspection and, if necessary, for painting.

Cathodic protection can also be given consideration for the steel parts of a clarifier. Cathodic protection involves the application of a direct current to submerged metal parts to prevent or retard corrosion. For proper application, the design of a unit must be studied in order to determine the proper system and get a realistic quotation from manufacturers of cathodic protection equipment. This type of protection has been used for a number of years and has proved quite successful at many installations. When used on new equipment, the steel surfaces are first painted with the usual shop coat which is touched up in the field. A final field painting is not generally required, but some parts of a unit should be painted since they are remote from the main body of water and the cathodic action is not effective in these remote areas. This applies to components such as flumes and partially submerged structural members at the top of the tank.

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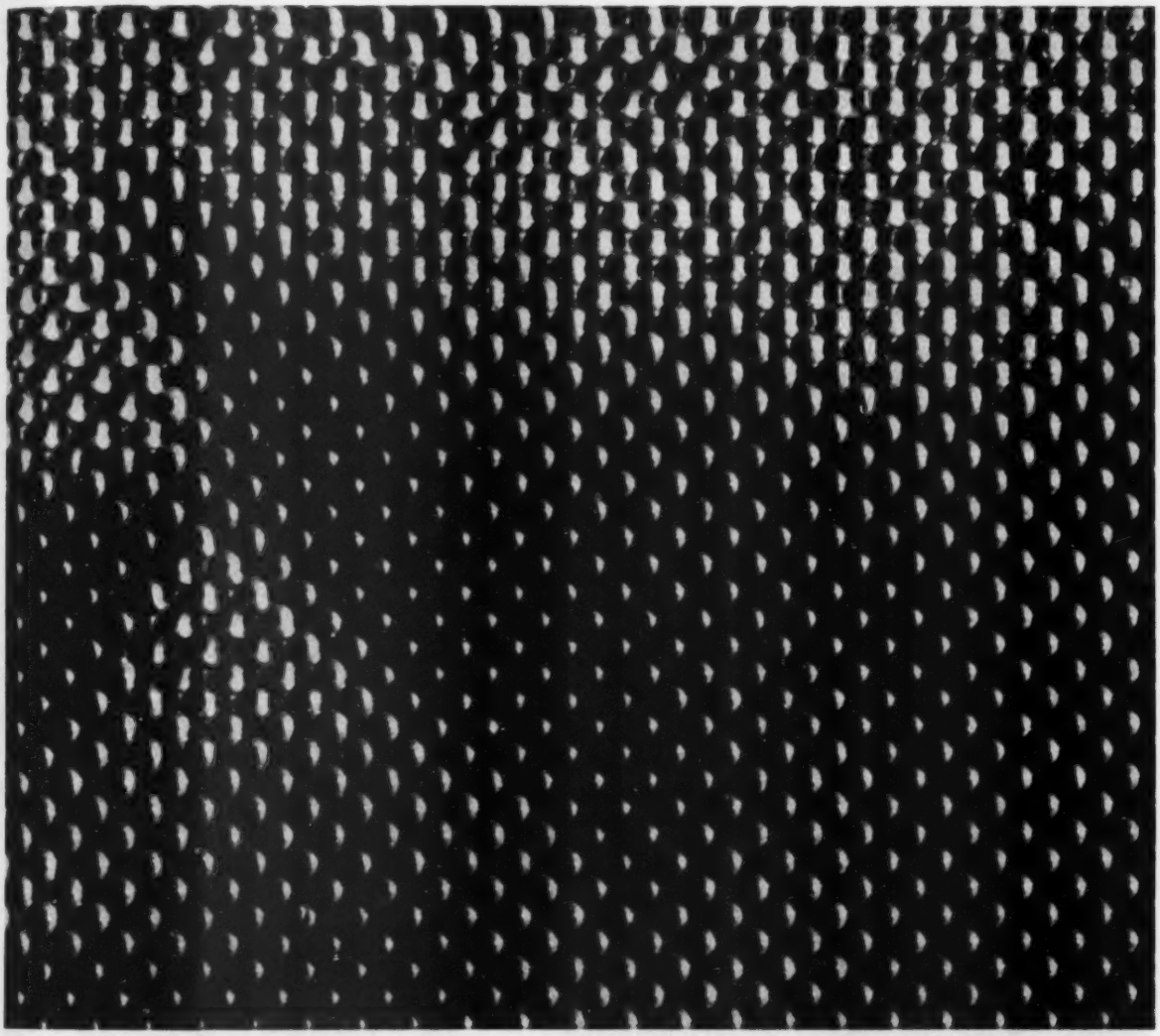

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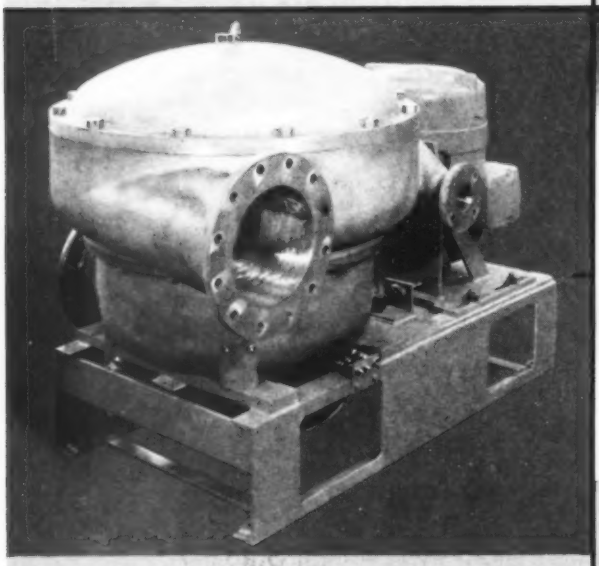
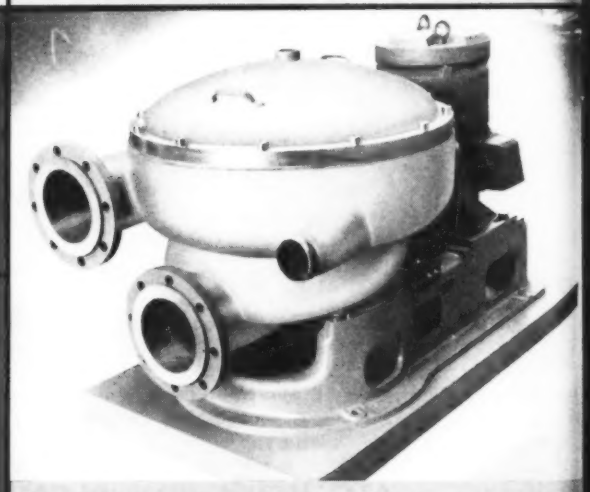


The **Model 10** Centriscreen is the pressure screen for handling approximately half the volume of the Model 14 — sometimes more on certain kinds and grades.



The new **Model 6** Centriscreen is the pressure screen for small Fourdriniers and for one screen per mold on cylinder machines. Only 30 inches high and 34 inches wide it delivers up to 1200 gpm. It possesses the superb dirt and shive removal efficiency and exceptional operating and maintenance economy of the larger models.

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON • ATLANTA 9, GEORGIA

Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

For more data circle 118 on Post Card

CURRENT COMMENTS

U. S. newsprint production rising steadily—Foreign competition in the field of rayon fibers

WARREN B. BULLOCK

Newsprint production in the United States may never equal that of Canada with its enormous spruce forests, but the development of technique for the utilization of southern pine is resulting in a steady increase in domestic output.

Statistics for 1959 show that U.S. production increased at a more rapid rate than in Canada, and reached an all time high of 1,964,131 tons—an increase of 11.7 per cent over 1958. On the other hand, Canadian output increased only 4.9 per cent over the previous year and was still below its historic peak of 1956. The trend is continuing. United States output in January, 1960, rose 8.3 per cent over January, 1959, while Canada increased its output only 7.4 per cent in the same period.

The dissolving pulp market

During the same week that the U.S. Pulp manufacturers (at the convention in New York) were hearing reports on the possibilities of the dissolving pulp market, two disturbing reports on foreign competition in the field of rayon fibers, a product of these pulps, came from widely different sources. Harry L. Dalton, vice president of the American Viscose Corp., speaking before the Society for Advancement of Management at Charlotte, N.C., said that imports of rayon staple have taken over 25 per cent of the U.S. market. He said that last year's imports, equivalent to the total output of two average-sized American plants, were 40 per cent above those of the year before.

At the same time, one of the best known American magazines published a special article questioning whether this nation's foreign aid program is jeopardizing American jobs. It stated that the Marshall plan to assist in the recovery of European industry has served to build up foreign industrial production of merchandise to be shipped at low prices to compete in the American market with domestic manufacturers. The writer cited the case of an investment by American Enka in North Carolina for the production of rayon fiber. The plant, costing $25 million, is facing such dumping of European imports that it may not be able to operate.

Meanwhile at the pulp manufacturers convention the members were being told by Rex Vincent, vice president of Bulkley Dunton Pulp Co., that three uses accounted for 74 per cent of the total U.S. demand for dissolving pulp—rayon acetate yarn, staple fiber and cellophane—and that 80 per cent of the world consumption of this pulp is in 46 countries other than the United States and Canada. United States produces less than half of the total output of the free world.

Integration continues

The trend toward integration of facilities and mergers of related companies continues unabated. Sherman Paper Products Co., producer of packaging specialties is to become a subsidiary of St. Regis Paper Co. Sherman has plants in Newton, Mass., Chicago and Los Angeles, with branches at San Francisco and Seattle, producing a sales volume of $12 million a year.

Union Bag-Camp Corp. is considering an offer of five shares for each six shares of River Raisin Paper Co., a producer of boards and corrugated packing material with plants at Monroe, Mich., and converting branches at Cleveland and Sharonville, Ohio; Eaton Rapids, Mich.; and Washington, Pa., which produced sales of nearly $20 million last year.

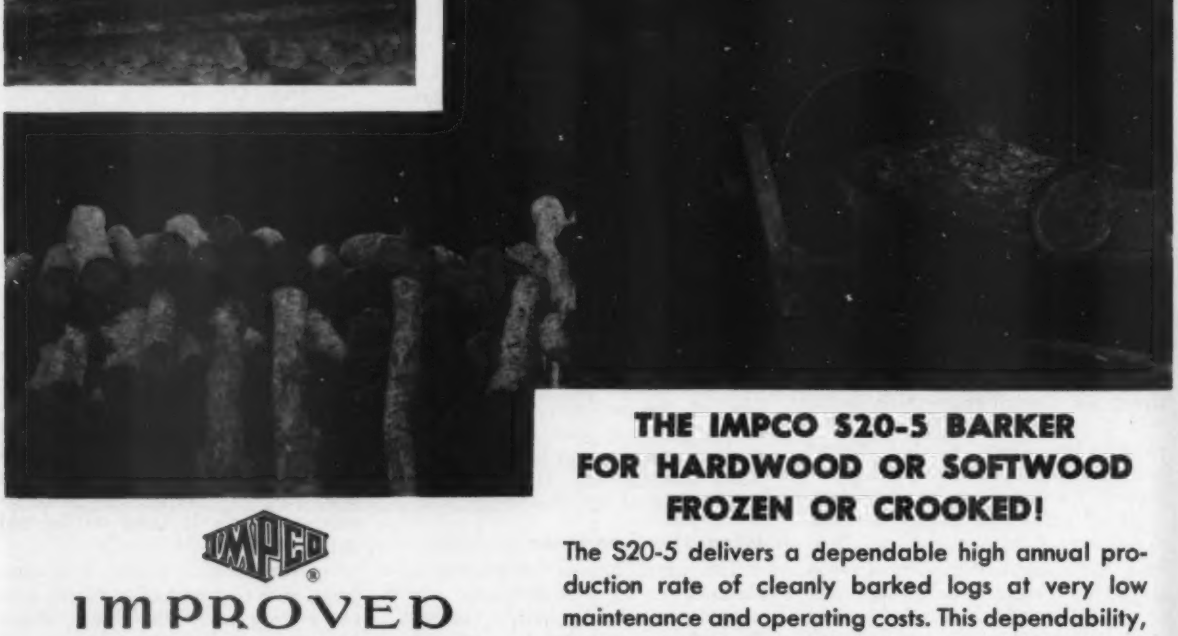
Sonoco Products Co. of Hartsville, S.C., is invading the north with the acquisition of Newton Paper Co. of Holyoke, Mass., and will take much of Newton's board output for the manufacture of cores for textiles and newsprint. Sonoco already has branches in Canada and Mexico.

Sealright-Oswego Falls Corp. has taken over the interest of Nashua Corp. in a jointly owned plant at Peterborough, Ont.

Smith-Lee Co. of Oneida, N. Y., an affiliate of J. P. Lewis Co. of nearby Beaver Falls., N.Y., is to purchase the assets of Sanitary Products Co. of Plainfield, N. J.

In addition to its regular dividend, St. Regis Paper Co. has voted a 2 per cent stock dividend. Penobscot Chemical Fibre Co. is another to give its stockholders a 2 per cent stock dividend. S. D. Warren Co. has split its stock on a two-for-one basis and will pay a quarterly dividend of 22½ cents per share on the new stock as compared with 40 cents on the old shares.

In order to unify a marketing campaign with the production of rag content writing papers, the Writing Paper Manufacturers Association has changed the association constitution to form a Cotton Fibre Paper Group as a substitute for the older Rag Content Paper Group. Nineteen of the member mills are participating in a national cotton fibre paper advertising program.



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MACHINERY INC.
NASHUA, NEW HAMPSHIRE

In Canada:
Sherbrooke Machineries Limited
Sherbrooke, Quebec

THE IMPCO S20-5 BARKER FOR HARDWOOD OR SOFTWOOD FROZEN OR CROOKED!

The S20-5 delivers a dependable high annual production rate of cleanly barked logs at very low maintenance and operating costs. This dependability, due to its extra-rugged design, is maintained with frozen crooked hardwood. Present installations average 250 cords/day with reported maintenance costs of 3 to 4 cents/cord, on logs in the 3" to 19" diameter range, down to 5' in length.

For more data circle 119 on Post Card

On forestry

Two paper companies, International and Finch-Pruyn, have presented to New York State a tract of 1,200 acres of Adirondack Mountain timberland, adjacent to present state forests. The tract is considered one of the finest scenic areas in the Adirondacks, and is at the crest of Wakeley Mountain, a 3,600-ft. peak near Indian Lake. In the formal presentation of the tract to the state, International's manager of northland woodlands said: "Consistent with our primary objectives to grow timber, the policy of our two companies has long been to manage our lands under multiple-use principles, to include recreation, wildlife management and watershed control". This program is exemplified by Finch Pruyn which for many years has so managed its forested areas that its annual tree growth is greater than the consumption of its paper mills.

Hidden in the annual report of the Great Northern Paper Co. is another example of the manner in which the paper industry is practicing forestry. The report says: "A purchase of 79,000 acres brings our timberland holdings to 2,210,000 acres. The company continues to harvest its woodlands under a long range forest management plan which assures an adequate wood supply in perpetuity. After more than sixty years of cutting, our forests now contain more usable timber than at any time during our ownership".

Net incomes

Allied Paper Corp.—Net income for 1959, $1,780,173; a year ago, $520,452.

American Writing Paper Co.—Net income in 1959, $641,414; a year ago, $674,829.

Celotex Corp.—Net income for three months ended January 31, $201,552; a year ago, $66,384.

Certain-Teed Products Corp.—Net income for 1959, $3,374,549; a year ago, $1,916,466.

Glatfelter Co., P. H.—Net income in 1959, $2,398,128; a year ago, $2,033,984.

National Vulcanized Fibre Co.—Net income for 1959, $1,840,439; a year ago, $637,392.

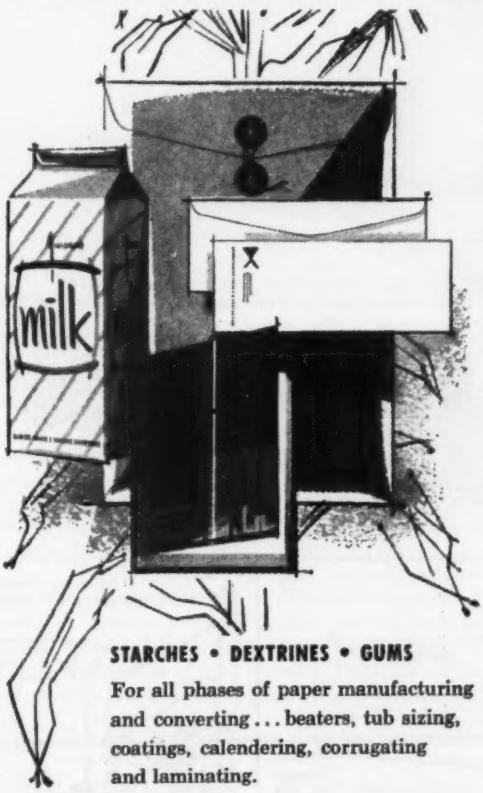
Nekoosa Edwards Paper Co.—Net income for 1959, $3,676,069; a year ago, $2,502,518.

Puget Sound Pulp & Timber Co.—Net income for 1959, $4,478,771; a year ago, $3,030,980.

West Virginia Pulp & Paper Co.—Net income for three months ended January 31, $2,414,000; a year ago, $2,757,000.

(Continued on page 70)

Look what happened to the corn we took off the cob



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For all phases of paper manufacturing and converting... beaters, tub sizing, coatings, calendering, corrugating and laminating.

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3226 James Place
Kalamazoo, Michigan
1122 Royce
Long Island City, N. Y.
4848 Fifth Street
New Orleans, Louisiana
314 Girod Street
Philadelphia, Pennsylvania
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How to Split Rolls with Ease and Speed

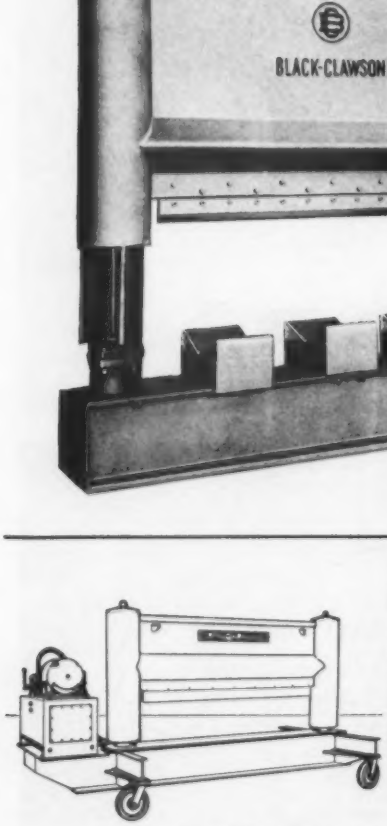
HYDRAULIC ROLL SPLITTER

This is the clean, efficient, modern way to split pulp rolls, butt, end or reject rolls for fast, economical repulping.

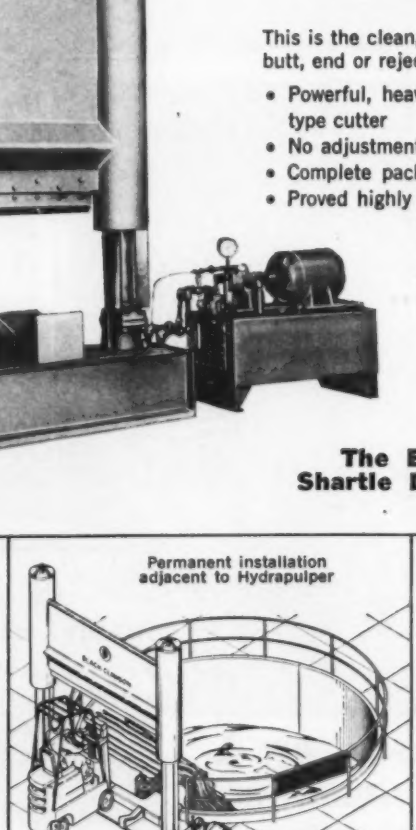
- Powerful, heavy duty hydraulically actuated guillotine type cutter
- No adjustments for variations in roll diameters
- Complete package with power unit, base and controls
- Proved highly successful in many mill installations
  - Safe... easy to load
  - Easy to operate... a one-man job
  - No noise, dust or frustration

Write or phone the Shartle Division for complete details.

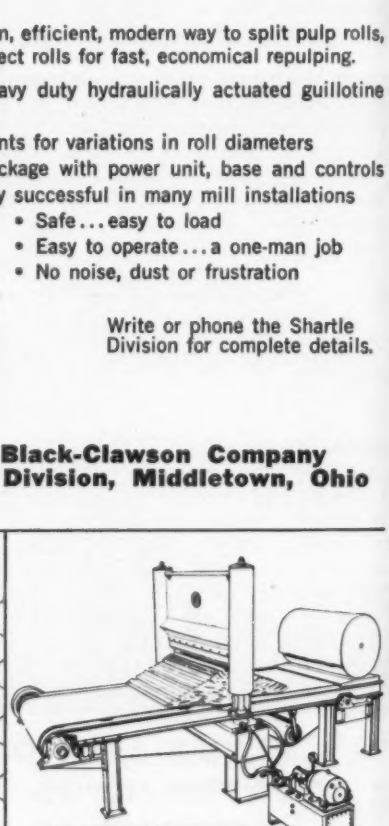
The Black-Clawson Company
Shartle Division, Middletown, Ohio



Portable roll splitter for use in several locations



Permanent installation adjacent to Hydrapulper



Roll splitter with conveyor for charging Hydrapulper

Single Source for Stock Preparation Machines & Systems

BLACK-CLAWSON

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NEWS of the INDUSTRY

Two-Week Summer Course in Paper

A two-week summer course in "Paper—Its Properties and Uses" will again be presented by the Department of Paper Technology at Lowell Technological Institute from June 6 to June 17.

Enrollment for the course is limited. Letters of application must be sent before May 10 to Paper Summer Course, Lowell Technological Institute, Lowell, Mass., with a deposit of $10 which will be returned if the application cannot be accepted. Fee for the course including tuition, room, meals, books and transportation on field trips is $225. For commuters the fee is $150.

May 1 — Deadline for Applications

Those who wish to contribute a paper at the Third Cellulose Conference are requested to send their application to: Cellulose Research Institute, State University College of Forestry at Syracuse University, Syracuse 10, N. Y. not later than May 1, 1960.

Three copies of a 200 to 300 word abstract should reach the Cellulose Research Institute before August 1, 1960. The complete manuscript should be submitted before October 1, 1960.

Subject of the papers must pertain directly or indirectly to cellulose, and must be of a fundamental nature. This means that papers which are concerned merely with technical data for which no scientific background has (yet) been found, will be excluded. A committee will decide whether papers are, on these grounds, acceptable or not. This committee reserves the right to refuse a contribution if it is considered unsuitable.

The Cellulose Conference will be held at Syracuse on October 27 and 28, 1960.

TAPPI, PIMA Members Observe Anniversary

The Michigan Division of the Paper Industry Management Association and the Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry recently celebrated the 25th anniversary of their yearly "get-togethers" at the Hotel Harris.

Arrangements for the event were under the direction of L. D. Nicholson, vice president of Hamilton Paper Co.'s Michigan Division. More than 500 persons attended the celebration. Harry E. Weston, secretary and treasurer of PIMA, and R. G. Macdonald, assistant to the president of TAPPI, provided interesting background of the first "get-together." Edward McFaul was guest speaker of the evening.

Safety Executive Committee Visits West Coast

The pulp and Paper Section of the National Safety Council held its spring Executive Committee meeting March 14 to 16 at Portland, Ore., in conjunction with the Oregon Labor-Management Safety Conference of the Pacific Coast Association of Pulp and Paper Manufacturers.

Visits were made by chartered bus to Weyerhaeuser Company's sawmill at Longview, Wash., largest in the world, and their new large plywood plant, thence to the company's logging operations in the 500,000-acre St. Helens Tree Farm east of Longview where typical operations of West Coast logging were studied.

A tour was also made via Columbia River Highway to Crown-Zellerbach's largest pulp and paper mill and its termendous variety of converting operations at Camas, Wash. The tour continued in chartered bus up the Columbia River to Bonneville Dam and the return to Portland past Multnomah Falls.

Evanston — Headquarters for Packaging Corp.

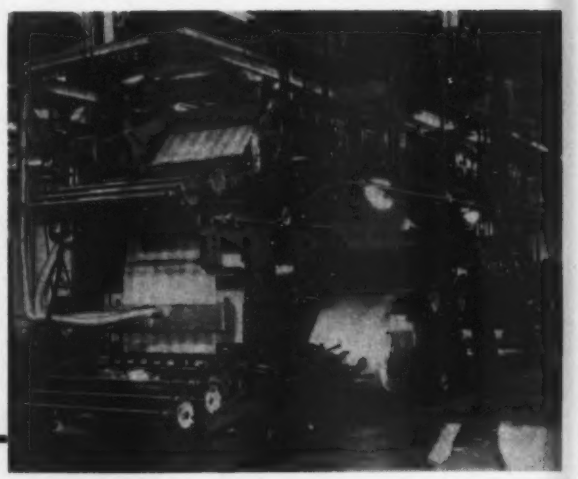
Packaging Corp. of America has established its corporate headquarters in Evanston, Ill.

The new concern operates a network of eight major mills and 41 converting plants in an area extending from New York to Utah. It produces jute and kraft linerboard, boxboard, bleached kraft, corrugated shipping containers, molded pulp products and many other paperboard products.

The company was formed on July 31, 1959, by a three-way merger of the former Central Fibre Products Co.; American Box Board Co.; and Ohio Boxboard. All three old-line concerns, are now major divisions of the new organization. Annual sales are currently at the level of approximately $140 million.

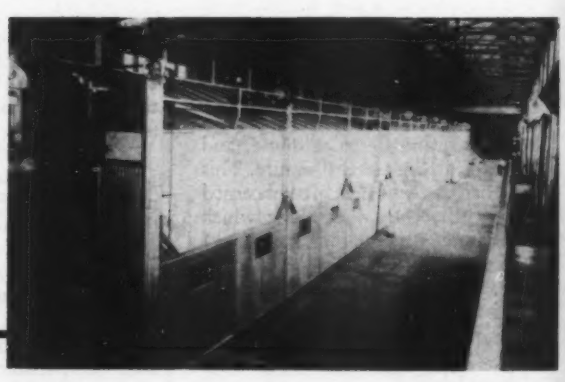
Recent Expansions in the Industry

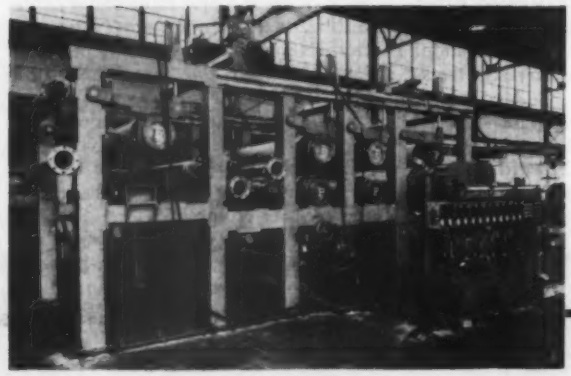
PATERSON PACIFIC PARCHMENT COMPANY has installed this new $75,000 flexographic press for printing the firm's extensive line of specialty paper products at its Sunnyvale, Calif., plant. The press was manufactured by the Westfalen, Germany, firm of Windmoller & Holscher. Heinrich Equipment Co. of New York represented the German firm in the transaction. It is built on a six-color frame so that two additional colors can be added. It will operate at a speed of 750 fpm.



CRYSTAL TISSUE COMPANY is now operating this new Yankee paper machine in full production at its plant in Middletown, Ohio. A superior grade of laminating tissue, to be known as Crystal Flatmount Tissue, will be one of the products to be produced on this new equipment.

WEST VIRGINIA PULP & PAPER COMPANY has added "on machine" coating to its No. 5 machine at Covington, Va. It also has added a totally enclosed hood on the machine. The unit produces board for such uses as cigaret cartons, drinking cups and foodboard. Conversion from open to closed hood was by J. O. Ross Engineering.





PATTON MFG. COMPANY has shipped a 57-ton, hydraulically-loaded wet end section to the Portorican Paper Products Co. in San Juan, Puerto Rico. The unit will be placed into a cylinder board machine. Framework is of stainless steel.

*Idea submitted by L. D. Nicolson, Hamilton Paper Company, Plainwell, Michigan

Photo by Harold M. Lambert

HAM FELTZ says:

"Reminds me of HAMILTON Felts . . . Highest Quality!"

*WIN . . . *A NEW Shakespeare Spincast Fishing Outfit!*

"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each month, the idea from a papermaker that we use wins a new 1960 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. *Every papermaking entrant* receives a famous Rex Spoon fishing lure—FREE. Send me your suggestion—today. Ham Feltz, 612 First National Bank Bldg., Cincinnati 2, Ohio."

YOU CAN'T BEAT

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FELTS

Rising 555 feet,
the graceful Washington Monument
towers above all other structures in Washington, D.C.—
just as—for quality and efficiency—Hamilton Felts
seem to tower above all other felts.
Since 1858, papermakers have found that
Hamilton Felts give longest quality performance
and less broke between change-overs.

"Hamilton Felts are 'water conditioned'
to run water like a sieve,
deliver drier sheets to the driers,
permit operators to run machines
at higher speeds with fewer stops."

If one of our 300 modern,
technically proven styles
won't solve your specific problem,
we'll be happy to design
a Hamilton Felt that will.
Just ask your Hamilton Felt Service Salesman.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

For more data circle 122 on Post Card

News of the Industry . . .

Provincial Paper to Install Fifth Machine

Provincial Paper Ltd. of Thorold, Ont., has authorized the installation of a fifth fine paper machine.

The new production facilities will enable the company to further expand its present lines and introduce new products.

New Company Formed

Presto Adhesive Paper Co. Inc. is a newly formed corporation located at 1245 Flower St., Glendale, Calif. The company manufactures pressure-sensitive adhesive paper stocks for the graphic arts field.

Murray McDougal, long prominent in the pressure-sensitive adhesive field, has been named president of the new company.

Georgia-Pacific Shows Definite Interest in Juneau area

Georgia-Pacific Alaska Co. of Portland, Ore., has made substantial expenditures in connection with the proposed Juneau Unit pulp mill enterprise.

Approximately 75 acres on the Douglas Island has been purchased for a mill site and a complete 500 ton-per-day mill has been designed. Engineers are also surveying the possibility of a complete integrated unit at Juneau including a large sawmill which would make chips available for the proposed pulp and paper mill and a chemical plant to utilize the waste from both the sawmill and the paper mill.

Patton Builds Largest Wet End Section

Patton Mfg. Co. has built its largest wet end section for a 100-in.-wide cylinder board machine and has shipped it to the Portorican Paper Products Co. located in San Juan, Peurto Rico.

The 115,000 lb. unit consists of everything between the existing cylinder mold and vats and the first dryer section, and is unusual in the liberal use of stainless steel.

The machine will manufacture liner and 9 point, as well as bleached manila for the mill's own conversion operations.

New Corn Starch Plant

Dixon Chemical & Research Inc. and Southern Starch Industries Inc. have joined forces to form a new company to be known as the Dixon Southern Chemicals Inc. This company was formed to operate the first corn starch manufacturing plant in the South.

Construction site is at Plymouth, North Carolina. The plant will produce 80,000 tons of industrial corn starch per year.

Earl J. Walsh, formerly with American Cyanamid Co., has been elected president of the new company.

Deerfield To Build Glassine Paper Mill

Plans to erect a Glassine paper mill near Augusta, Ga., has been announced by Deerfield Glassine Co. Inc. of Monroe Bridge, Mass.

Deerfield decided to locate adjacent to the new mill (now under construction) of Continental Can Co., since Continental will be in a position to furnish all of the different kraft grades necessary. Continental will supply slush kraft pulps through a pipeline to the new mill and will also supply water and other services for the Deerfield plants.

It is said that the new mill will be operated as a wholly owned division of the parent company.

New Bleach Plant for Rhinelander

This summer, the Rhinelander Paper Co. (a division of St. Regis Paper Co.) will be building a continuous

You'll get exceptionally low "first cost"
You'll use minimum power
You'll need less maintenance
with the
Kalamazoo "Side Hill" Washer

These practical slide washers give a better and more effective wash job than other washing methods. They may also be used as thickeners and savealls. These units are designed by Kalamazoo engineers — experts in serving the paper industry for more than 90 years. Our experience enables us to completely prefabricate the units of top quality materials. Installation supervision can be furnished.
Laboratory size units are available for experimental purposes in determining the proper angle and screen mesh.
Write today for information on capacities and cost estimates.

WOOD TANK DIVISION
Kalamazoo TANK & SILO CO.
260 HARRISON ST.
KALAMAZOO, MICH.
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bleach plant with a maximum capacity of 120 tons of bleached stock per day.

The three stages of the new plant are: (1) chlorination up-flow at 3 per cent consistency; (2) caustic up-flow at 3 per cent consistency, or as an alternate method, 12 per cent consistency down-flow; and (3) hypochlorite down-flow at 12 per cent consistency.

A separate ventilating system to maintain building pressure will be installed in the new building. Water usage in the new plant will be approximately 35,000 gal. of fresh water per ton of bleached stock.

Moraine to Triple Production

The Moraine paper mill at West Carrollton, Ohio, will begin an expansion program that will triple the production capacity.

A No. 2 paper machine will be installed in an existing area in the present machine room. It is designed to produce a sheet 168 in. wide in bond and offset grades.

A waste paper and pulp storage room and a deinking plant, with a combined space of 100,000 sq. ft., will be constructed at the south end of the present building. At the north end of the present building, a finished paper and shipping storage building of about 89,000 sq. ft. will also be built.

Construction of a clay unloading shed and an addition to the power house to provide space for a new boiler have also been added to the plans.

Completion is scheduled for late 1961.

Moraine Paper Co. is a division of American Envelope Co., which Kimberly-Clark acquired in February of 1959.

Pennsalt and Olin Mathieson Jointly Form New Company

Pennsalt Chemicals Corp. and Olin Mathieson Chemical Corp. have jointly formed a new company to be known as Penn-Olin Chemical Co. It will be formed as a joint subsidiary and will be owned equally by the two corporations.

The $6,500,000 venture will be organized to produce sodium chlorate and other chlorate compounds. Preliminary engineering has been completed and construction is expected to start soon on a 25,000-ton-a-year plant at Calvert City, Ky.

Sodium chlorate, in increasing demand from the pulp and paper industry, is also the major raw material used in the production of ammonium perchlorate, a solid rocket fuel oxidizer, and in the manufacture of defoliants and weed killers.

U.S. Gypsum Expands in Florida

United States Gypsum Co. will begin construction of a new paper plant on a 19-acre plot adjacent to the company's existing gypsum plant in Jacksonville, Fla.

The new plant will manufacture a full line of chipboard papers to be used exclusively for the company's gypsum products. The papers will be used on the Sheetrock gypsum wallboard, Rocklath plaster base and USG gypsum sheathing manufactured at USG plants in Jacksonville, Norfolk and Plasterco, Va.

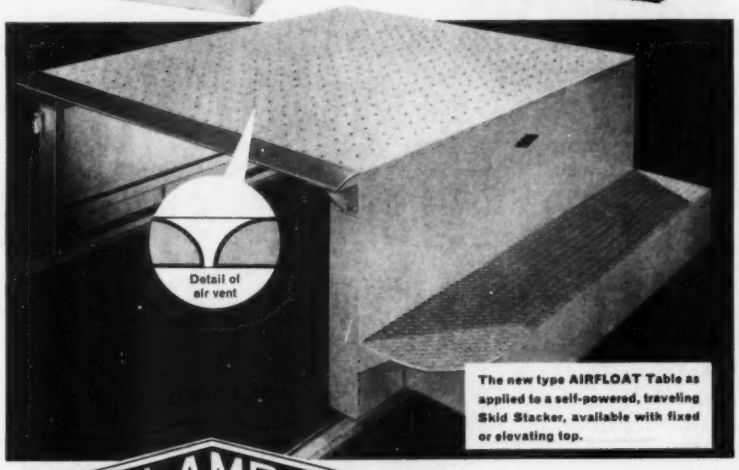
Completion is expected in February 1961.

Stowe-Woodward Expands in Wisconsin

A new plant for the rubber covering of rolls is being built in Neenah, Wis., by Stowe-Woodward Inc.

A machine, which is said to be the world's largest two-wheel grinder for the surfacing of rolls, and will grind rolls up to 63 in. in diameter and up

NEW



The new type AIRFLOAT Table as applied to a self-powered, traveling Skid Stacker, available with fixed or elevating top.

LAMB

AIRFLOAT® TABLE

Low Initial Cost and Operating Economy

A *new* development in the well-known LAMB Airfloat Table—an economical, open-orifice design providing constant, all-over escape of air from the table top. No marking of bottom sheets—no expensive air-release valves. The unusually small, open holes provided permit use of very low air pressure, furnished by a blower. The constant escape of air is very light and creates no bothersome effect in this new, cost-saving LAMB Airfloat Table. Stacks push effortlessly on a film of air.

Yes—the standard LAMB Airfloat Table with ball air-escape valves is also available. Write for literature.

Write for complete information.

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to 380 in. face, will be one of the principal units installed in the new plant.

AviSun Builds Another Polypropylene Plant

AviSun Corp. of Philadelphia has awarded a contract for the building of a 100 million lb.-per-year polypropylene plant which will be located in the Eastern part of the United States.

AviSun Corp. was formed one year ago as a joint venture of American Viscose Corp. and the Sun Oil Co. The company operates a 20 million lb.-per-year polypropylene plant at Port Reading, N. J.; a 10 million lb.-per-year polypropylene film plant at New Castle, Del.; and a polypropylene fiber pilot plant, also at New Castle.

Rap-In-Wax Changes Name

After 33 years, The Rap-In-Wax Paper Co. has changed its name to: The Rap-In-Wax Co.

The company, which dealt exclusively in waxed bread wrappers, now produce more foil bread wraps. This along with other expansions in the company has tended to broaden its line of products. With these changes, the company thought the work "Paper" was too restrictive.

General Aniline Expands Sales Offices

General Aniline & Film Corp. has announced it will build a new facility in South San Francisco.

The new location will be a consolidated sales office and warehouse for the corporation's three main divisions — Ansco, Ozalid and Dyestuff & Chemical — to serve western and northwestern states.

July 15 is the date set for completion.

Company Gets New Name and New Owner

Fluted Paper Products Co. is the new name for the former J. P. Mfg. Co. of South Norwalk, Conn. The company provides fluted paper products for the bakery and confectionery fields.

Frederick C. Stakel, a veteran in the paper products industry, has purchased control and is serving as president and chief executive officer. He formerly directed advertising and sales promotion for the St. Regis Paper Co., and before that, held executive posts with Brown Co., Scott Paper and Alcoa.

Henry P. Clark has been elected vice president and general manager of the company.

Forest Research Lab Established by Simpson Timber

Simpson Timber Co. of Seattle has announced plans for establishing a forest products research and development laboratory on a 10-acre tract near Bellevue, Wash.

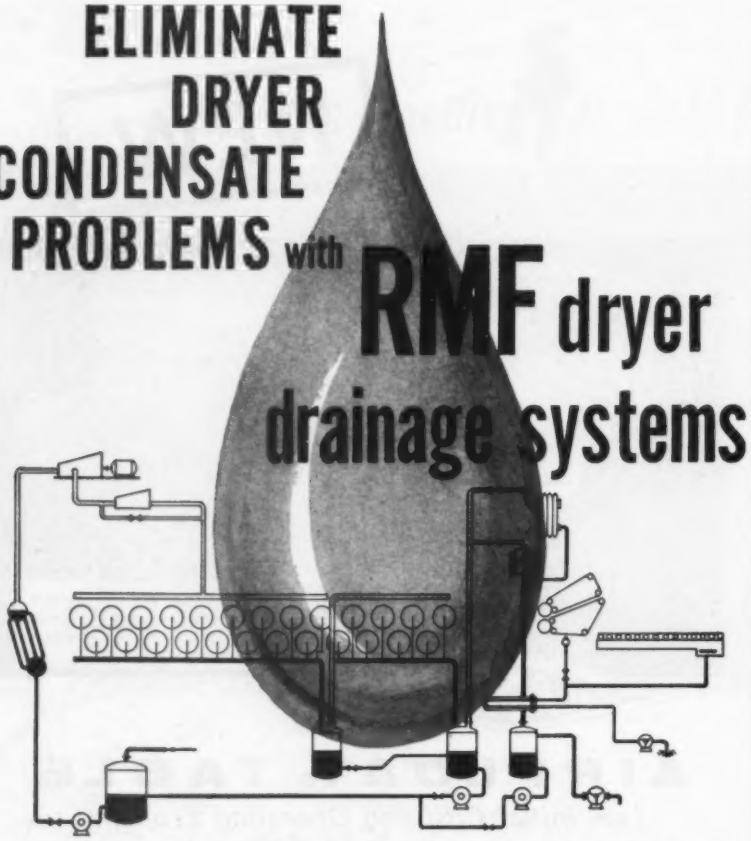
The new laboratory will service all branches of the Simpson Co. To meet the varied needs of these operations, the laboratory will be staffed with 40 scientists, technicians and project specialists in its initial staff and will be equipped to conduct experiments on a broad scope of forest products of present or potential interest.

The laboratory is Simpson's second major building project announced for 1960. Construction of an ultra-modern sawmill at Shelton, Wash., began this month.

$30 Million Program Planned by Dow

An expansion program, estimated at $30 million, has been announced by Dow Chemical Co. for its Louisiana

ELIMINATE DRYER CONDENSATE PROBLEMS with RMF dryer drainage systems



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Division located at Plaquemine, La.

A plant for the production of ammonia will be constructed. It will make both anhydrous and aqueous ammonia. Completion and start-up is scheduled for late 1961 and early 1962.

The company has an expansion project now in progress at Plaquemine, involving an investment of about $12 million. A high-pressure polyethylene plant, a major part of the current work, is scheduled for operation this fall.

When completed, the expansion will bring Dow's total investment at Plaquemine to more than $100 million.

Marathon's No. 3 Scheduled for Production

Marathon Southern Corp.'s third paper machine is scheduled to go into production by mid-summer of this year.

Capacity of the new Black-Clawson will be approximately 300 tons of bleached board a day and it will be equipped with 238-in. wire.

The addition of the new machine will necessitate additional steam and power facilities, and additional pulp digester and additions in the plant's causticizing area. The machine is expected to more than double the plant's present paper-making capacity.

Marathon Southern Corp. is an operating unit of the Pulp & Paper Division of Marathon—a division of American Can Co.

The division is headed by Russell C. Flom, who is Marathon's vice president; and by John Bard, production manager.

Coming Events

TAPPI

May 23-25 — 11th Annual Coating Conference, Edgewater Beach Hotel, Chicago, Ill.

June 14-16 — Pulp Bleaching Conference, Edgewater Beach Hotel, Chicago, Ill.

August 24-26 — Forest Biology Symposium, New Washington Hotel, Seattle, Wash.

October 10-13 — 10th Corrugated Containers Conference, Royal York Hotel, Toronto, Canada.

PIMA

April 23 — Michigan Division, Hotel Harris, Kalamazoo, Mich.

April 29 — New York-Canadian Div., Sheraton-Syracuse Inn, East Syracuse, N. Y.

May 12-14 — Pennsylvania-New Jersey-Delaware Division (Spring Meeting), Hotel du Pont, Wilmington, Del.

June 7-9 — National Meeting, St. Francis Hotel, San Francisco, Calif.

OTHER MEETINGS

April 19 — SAPI Eastern Luncheon meeting.

April 20-22 — 6th Annual Northeastern Logging Congress, Utica, N. Y.

April 20-27 — Interpack in conjunction with the 4th European Packaging Federation Congress, Dusseldorf (Germany/Allemagne).

April 21-22 — 6th Annual Conference on Electrical Engineering in the Pulp and Paper Industry, University of Florida, Gainesville, Fla.

April 29 — May 8 — Sixth International Exhibition of the Paper, Printing and Graphic Arts Industries, Exhibition Palace, Paris, France.

May 9 — New England Division of National Association of Waste Material Dealers, Statler Hotel, Boston, Mass.

May 12-13 — 24th Annual Executives Conference of the Institute of Paper Chemistry, Institute of Paper Chemistry Campus, Appleton, Wis.

May 22-25 — 37th Annual Convention and Merchandise Exhibition of the National Sanitary Supply Association, Fontainebleau Hotel, Miami Beach, Fla.

May 23-26 — Annual Design Engineering Show, New York Coliseum, New York.

June 6-8 — Material Handling Institute New England Show, Commonwealth Armory, Boston, Mass.

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AT ALL 3 CRITICAL AREAS

Whitney MSL Chain is lubricated for life by oil-impregnated, sintered steel bushings—an exclusive development of Whitney Research. With this development, Whitney solves a basic chain problem . . . **more damage is caused by faulty chain lubrication than by years of normal service.** Pressure and heat cause built-in lubricant to expand and flow from bushings, providing a constant supply of lubricant to every working part of the chain. When drive stops, bushings re-absorb oil, ensuring a permanent oil supply for the life of the chain. By solving the lubrication problem, and because of other important design advantages, Whitney MSL Chain outlasts conventional chain as much as 5 to 1 in severe operating environments.

Critical Area 1

PIN—Protective film of oil completely lubricates the live bearing area between pin and bushing, minimizing wear by reducing metal-to-metal contact.

Critical Area 2

PLATES—Whitney oil-impregnated sintered steel bushings extend beyond surface of inside plates to: act as lubricated thrust bearings, control clearance, and provide an oil cushion between plates, eliminating plate galling and seizing frequently caused by misalignment of sprockets.

Critical Area 3

SPROCKET ENGAGEMENT—Oil film on exterior surface of Whitney MSL Sintered Steel Bushings provides constant lubrication between sprocket teeth and chain. Whitney MSL Chain requires no rollers, as the tough oil film on the bushing surface provides smooth sprocket engagement, cushions impact and reduces drive wear.

WHITNEY MSL CHAINS MEET ASA STANDARDS

All essential dimensions of Whitney Standard and Extended Pitch MSL Chain conform fully to ASA Standards, making it completely interchangeable with any similar pitch ASA standard chain, simplifying specification for new equipment, or as a replacement for existing drives.

Whitney MSL Chain is carried in stock by Distributors in all parts of the United States, for prompt delivery.

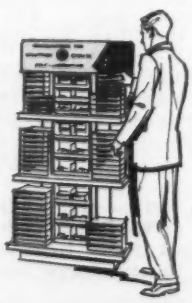
* Maximum Service Life

Whitney oil-impregnated bushings—developed through continuous Whitney Research—are produced exclusively by Whitney to assure MSL Chain users of highest quality and reliability.

Inherent material characteristics of Whitney Sintered Steel Bushings, plus bushing configuration that provides greater contact area between bushings and links, permit high interference fit, which pre-loads links and gives maximum fatigue resistance.

Controlled clearance between plates promotes self-cleaning action.

MSL Chain is carried IN STOCK by your Whitney Distributor. Ask him to show you how and why Whitney MSL Chain gives you more chain drive value per dollar.



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NAMES *in the* NEWS

Valley Iron Works Corp.

E. A. Berry of Longview, Wash., has been appointed to serve Valley Iron Works on the West Coast. Berry has been associated with Asten-Hill Mfg. Co. and Dorr-Oliver Inc. He also had 10 years' experience with Longview Fibre Co.

Arthur D. Little Inc.

Lt. James M. Gavin (USA Ret.) has been elected president of Arthur D. Little Inc. He will take over the international industrial research company as the fourth president in its 74 years of service to the industry.

Raymond Stevens, retiring president, has been with ADL for 40 years. He has been named chairman of the executive committee.

North Carolina State College

Professor C. Earl Libby will retire this June as head of the department of pulp and paper technology at North Carolina State College. He was associated for 32 years with the College of Forestry and 20 of these years was served as head of the department of pulp and paper manufacture.

Active in associations connected with the industry, he has contributed much material to the literature of papermaking. He is also noted for the development of paper-making pulps from northern hardwoods.

This summer, from July 11 to August 19, Professor Libby will be a member of the staff for the first Summer Institute for the Pulp and Paper Industry at the University of Maine.

Lodding Engineering Corp.

James K. Gardner Jr. has been appointed as marketing manager. He has spent the past three and a half years with the Cuno Engr. Corp. and previous to that, he had been associated with Babcock & Wilcox.

Nalco Chemical Co.

Dr. John W. Ryznar, vice president and technical director, has been promoted to the new position of technical representative in corporate management.

Thomas C. Jones, president of the Chicago based industrial chemical manufacturing firm, and Dr. Ryznar will be responsible for planning, guiding and coordinating all technical activities of the company and its subsidiaries.

It was also announced that Dr. William P. Hettinger Jr. has been appointed as Nalco's director of research. He will continue to coordinate research activity for the company's Catalyst Division, for which he has been head of research since joining Nalco in 1957.

Samuel M. Langston Co.

H. Clifford Mayhew has retired after 35 years of service with the company. Before his retirement, he held the position of vice president, customer service.

Customer service will now be under the direction of Fred A. Leser Jr., a sales engineer with Langston for eight years.

Longview Fibre Co.

The following new officers have been elected to new positions by the board of directors.

R. P. Wollenberg, previously vice president of operations, is now executive vice president.

W. W. Clarke, formerly assistant mill manager, is now vice president of production and mill manager.

L. C. Peabody of San Francisco is promoted from secretary-treasurer and director of sales to vice president of sales.

George B. Downing, president of Downing Box Co. (now a wholly owned subsidiary), has been elected a director and member of the executive committee of the parent Longview Fibre.

G. E. Schwartz, previously assistant treasurer and chief accountant, has been advanced to secretary-treasurer.

R. G. McDermott has been advanced from assistant accountant to chief accountant and will also be assistant treasurer.

N. H. Anderson, who has been assistant to the mill manager, has been promoted to assistant mill manager at Longview.

F. J. Rack of the San Francisco office has been promoted from assistant to the director of sales to director of paper sales.

G. E. Schwartz ▸

◂ F. J. Rack

N. H. Anderson ▸

◂ R. P. Wollenberg

R. G. McDermott ▸

◂ W. W. Clarke

L. C. Peabody ▸

Raybestos-Manhattan Inc.

The Manhattan Rubber Division of Raybestos-Manhattan has announced the following two appointments.

M. G. Tolsma will cover the area comprising all of Connecticut and Vermont, Southeast New York, Central and Western Massachusetts as a

PERFORMANCE

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Each Albany Felt is tailor-made to the exact requirements of your machine. That's why you can be sure that profitable trouble-free performance will result.

Albany Felts are noted for performance, and *nearly every paper and paperboard maker consults Albany* on how their felts should be designed. This step means savings and more saleable tons per day.

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In many high-grade paperboard mills, FINISH is a major objective. Finish . . . to meet the exacting requirements of today's modern packaging industry, must be satin-smooth. Super-smooth finishes require the right felt, which means the right design, correct blending of wools and synthetics, and close manufacturing tolerances.

The Albany Felt research of "yesterday" has resulted in superior felts which have these special features for better finish, together with trouble-free operation that assures maximum drainage and production. For example, the exclusive Albany J-3 Chemical Treatment, which resulted from research, gives the felt a softness and openness which helps toward fine finish and longer felt life. So you can see that our Research is not an "ivory tower" proposition — to you it means better finish, maximum daily production, less down time — in other words, improved felt performance.

J-3

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Names in the News . . .

roll-covering specialist servicing the industries in these areas.

J. V. Getchius will service the rubber roll requirements in the North Jersey area, primarily the paper and textile mills.

Both men are headquartered at Passaic, N. J.

Chas. T. Main Inc.

At the company's annual February meeting, the following men were elected as directors of the Corporation: C. M. Flint, Van Court M. Hare and Will J. Lessard.

Stebbins Engineering & Mfg. Co.

John E. Maxon has been elected to the position of executive vice president. Since 1951, he has been secretary and sales manager for the company.

Brainard C. Rushlow, president of the Watertown National Bank, was named a director of the company.

J. E. Maxon

R. B. Robertson Sr.

K. R. Bendetsen

D. J. Thomson

Champion Paper & Fibre Co.

At a special meeting of the board of directors, action was taken in connection with the election of executive officers to succeed to the senior management of the company.

These steps were taken because of the untimely passing of Reuben B. Robertson Jr., who was president and chief executive officer for the company.

Reuben B. Robertson Sr., who has been chairman of the board and served as head of the company for many years, asked that he be relieved of the chairmanship, and was elected honorary chairman. He will continue as a member of the board.

Dwight J. Thomson was elected as new chairman of the board and Karl R. Bendetsen was elected as president. Both men were previously serving as executive vice presidents. Bendetsen was also elected to the board to succeed the late Reuben B. Robertson Jr.

Sandy Hill Iron & Brass Works

George E. Clink, chief development engineer and assistant to the vice president of engineering, has now been advanced to assistant vice president.

Charles S. Adams, assistant sales manager, has been named an assistant vice president.

Floyd H. Rourke, manager of the accounting department and assistant comptroller, has been named assistant to the president.

Signode Steel Strapping Co.

Raymond Lumley has been selected to a newly created position of paper industry manager for the company. Lumley has been with Signode for ten years and has had extensive experience in serving the paper industry. He will coordinate sales and service to the paper industry in his new capacity.

Necrology . . .

Reuben B. Robertson Jr.

Reuben B. Robertson Jr., president of Champion Paper & Fibre Co. of Hamilton, O., who only in February was elected first five president of the American Paper & Pulp Association, was killed by an automobile on March 13.

Robertson was prominent, not only in the paper industry, but was deputy secretary of defense under Secretary McElroy, with whom he has served as a co-director of the Proctor & Gamble Co. Once before, he was given his first step on the ladder up to the presidency of the APPA, but resigned to go into government service in the Department of Defense.

(Continued on page 70)

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Without attention, without variation, without let-up — DeZurik Stock Consistency Regulators control consistencies in mills all over the world.

These DeZurik Regulators — Pipe Line type — handle the full volume of stock. Two other types — Stuff Box and Pan — adapt to a wide variety of installations and tonnages! They're guaranteed to hold within limits of plus or minus .1% — and many are holding to plus or minus .02%!

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FOREIGN ABSTRACTS

The viscometric D.P. determination of cellulose

This is an unusually comprehensive study emanating from the Central Laboratory of the Swedish Cellulose Industry. Taking representative values for cellulose nitrates used in such determinations and reducing them all to the same nitrogen content and the same measuring temperature, an attempt was made to arrive at a more accurate Staudinger constant, and also to obtain more accurate values for the degree of polymerization. D.P. values for cellulose in Cuam were also considered. The investigation was a highly critical one. The authors studied the more important factors and possible sources of error involved in the viscosity determination. The following was discussed: (a) estimation of the mean D.P. values; (b) the influence of the degree of substitution (*i.e.* the nitrogen content); (c) the velocity gradients; (d) the Hagenbach correction; (e) concentrations and concentration units used; (f) the influence of solvent; (g) the extrapolation of the concentration to zero.

Based on work done in Stockholm, an explanation is furnished of the influence of temperature on viscosity, the Martin constant (k) and the Mark-Houwink exponent (a). Excepting in the case of the cellulose-Cuam system, the influence of temperature on the viscosity determination must always be considered. The terms k and a can obviously be regarded as being independent of temperature within the usual measurement. However the constant k may be influenced by the state in which the polymer occurs, and may then assume varying values; *e.g.* as shown with regenerated alkali cellulose in Cuam. For D.P. values in the range 100 to 2000, it appears that the D.P. can be expressed most satisfactorily by the formula: $[\eta] = 13.6 \times 10^{-3} D.P.^{0.948}$, when the following conditions were used; fractionated samples of nitrocellulose, containing 13.8 per cent nitrogen, dissolved in acetone and measured at 20° C.

Approximately 105 references, 9 tables and 17 figures are given. E. Treiber and B. Abrahamson. *Holzforschung* **13**, 161 to 177 (1959) (in German with English summary.)

Mannogalactans in papermaking

Three commercial galactomannan gums were used in making laboratory sheets, as well as in the plant scale manufacture of sack and cable papers with high tear and tensile strength, parchment and copying papers with a closed surface, and magazine and other grades of printing papers that had a high filler retention. In every case, the addition of the gums improved sheet properties. Thus smoothness, strength properties, and transparency were improved. Machine operation was facilitated, and machine speed was increased by 10 to 13 per cent. Drainage improved and this permitted savings on the drier section. Beating time was shortened by 20 to 30 per cent without reduction of the strength properties. The retention of fillers and of fines was improved and thus the load of fiber recovery equipment was relieved. There was however one relatively important disadvantages of using the galactomannans in the case of certain paper sheets; there was an increase in the air permeability.

Eight references. Elzbieta Hochauz. *Zellstoff u Papier* **8**, No 7,256 to 261 (1959) (original in German) (through *Abstr. Bull. Inst. Paper Chem.* **30**, 638 to 639) (1960).

Improving the brightness of eucalypt groundwood

Most of the mechanical pulp used in this study emanated from *Eucalyptus regnans*, and ranged in age from 180 to 300 years. This wood led to certain problems in maintaining the brightness of newsprint, which were not met with in the case of coniferous groundwoods. Many of these difficulties could be traced to the rather high tannin content in eucalypts, and the tendency of this tannin to react with metallic salts to give colored compounds. The tannin is partly responsible for the brown color of the sheet when the paper is dried on the paper machine; this often causes a loss in brightness of 4 units. The tannin apparently also causes the

rapid yellowing of paper when this is exposed to sunlight, and it also gives rise to difficulties in bleaching with sodium hypochlorite or with sodium peroxide.

When these mechanical pulps retain metallic ions, brown, yellow or blue tannin-complexes may be formed and these are then deposited on the pulp fibers. Usually, calcium and magnesium ions have little effect; those due to zinc ions are often not very serious, but those due to aluminum, copper and ferric ions may be extremely serious. These effects are discussed at some length. This type of discoloration can be prevented by washing such mechanical pulps very thoroughly at a pH below 2.6. This normally removes the salts that are objectionable but, thereafter, contamination with other chemicals (and also with steel) must be avoided.

Attempts to inactivate the metallic ions by complexing with such reagents as ethylenediamine tetra-acetic acid were not successful; probably due to the large amounts of tannin that were present. On the other hand, relatively large amounts of tannin could be extracted with boiling water or with dilute caustic soda, and the tannin could also be destroyed by certain types of bleaching, but none of these methods are acceptable. Not only were they uneconomical, but they gave pulps that were no longer suited to the manufacture of newsprint. Brightness of a pulp could be maintained (but not increased) by using zinc dithionite.

J. W. Tardif. *Appita* **13,** 58 to 73 (1959).

Small but significant differences between two rayon pulps

Two beechwood sulfite dissolving pulps were found to differ greatly, both in their reactivity and in the filterability of their viscose solutions. The usual analytical procedures shed no light on these differences. Improved techniques failed to distinguish between them, since their average degrees of polymerization, ash contents, α-cellulose, copper numbers and the percentage of xylan were practically identical. The less satisfactory pulp was slightly (but not too significantly) higher in mannan. No unequivocal indications were furnished by the routine staining reactions, or by determinations of the carbonyl and carboxyl contents. Even when the conditions of xanthation were varied widely, with reference to the caustic soda concentrations, excess of carbon bisulfide, and time of treatment, the differences in reactivity could not be accounted for satisfactorily.

Accessibility as indicated by heterogeneous hydrolysis with 1.5N sulfuric acid at 60° C. and a pulp consistency of 3.3 per cent, failed to really explain the different behavior of the two pulps, nor did solubility tests, carried out in cadoxene solutions having graduated dissolving power, show more than slight differences in turbidity in a spectrophotometer. A better means of explaining the differences was found finally by studying their respective chain-length distributions in EWNN (ferric sodium tartrate solutions in sodium hydroxide). Here, the unsatisfactory pulp contained a higher proportion of longer cellulose chains than did the normal (satisfactory) rayon pulp. This indicated that adequate hydrolysis of the chains during the pulping operation was essential in furnishing a pulp with satisfactory reactivity, and suitable properties during xanthation.

Twenty eight references are given. G. Jayme and J. Weidenmüller. *Das Papier* **13,** 531 to 536 (1959) (in German).

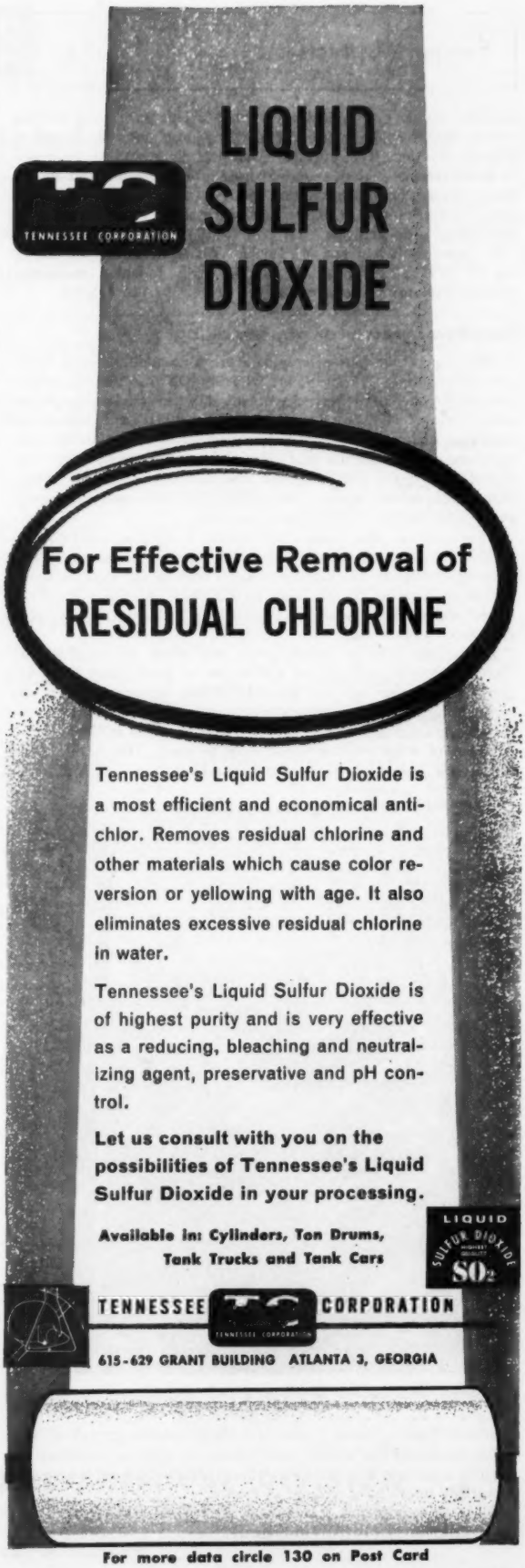
Paper from synthetic and inorganic fibers

The author reports his experiments on the manufacture of papers made from inorganic and organic synthetic fibers, and describes the problems encountered and the possible applications of the various products. Special emphasis is placed on the specific advantages of glass fiber for certain specialty papers that must be resistant to weathering, sterilization, micro-organisims, insects and to combustion. Banknote paper and filters are included. The main difficulties encountered were the hydrophobic properties of glass and the lack of interfiber bonding. Various fibers studied included basalt, slag wool, high strength rayon viscose, perlon and wool.

A. J. Hentschel. *Zellstoff u Papier* 8, No. 4, 122 to 127 (1959) (original in German, with English and Russian summaries) through *Abstr. Bull. Inst. Paper Chem.* 30, 620 (1960).

Study on mitsumata bark

This is one of a series of articles dealing (indirectly in this case) with Japanese handmade paper. Mitsumata (Edgeworthia papirifera) bark holocellulose was extracted with alkali, and the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acidified extract precipitated with acetone. This gave a crude xylan which was freed from glucose and arabinose units by means of Fehling solution. The purified xylan was then studied by means of methylation, oxidation and hydrolysis experiments and its average degree of polymerization was determined. Approximately 170 D-xylopyranose units are linked through 1-4 β bonds, and these carry a few branches.

S. Akira, R. Goto, and Y. Takedo. *Wood Research* No. 21, 19 to 25 (1959) (original in English with Japanese summary) through the *Abstr. Bull. Inst. Paper Chem.* 30, 322 (1959).

Sorghum, grown for papermaking

This paper is in part a reply to a previous publication by Matagrin (*Papeterie* 81,753 (1959), who implied that the use of sorghum (Broom corn) was uneconomical when used in pulp and papermaking. The present author denies this, and makes the following claims. A plant manufacturing 50 tons of bleached pulp *per diem* could make this at a cost of about 39 francs per kg. This would include the cost of fibrous raw materials, chemicals, operations, fuel, labor, repairs, amortization of buildings and equipment, insurance and miscellaneous expenses.

The claim is also made that within 4 months, sorghum can yield about 20 tons of cellulosic material per hectare, and that pulping operations are actually simpler than in the case of wood. Yields as high as 50 per cent of bleached pulp have been obtained and these, it is claimed, have high breaking lengths, good resistance to burst, etc.

Differences between straw pulps and those of sorghum are discussed briefly, and various advantages of pares made from sorghum are emphasized. For example, strong wrapping papers can be manufactured from sorghum. The conclusion reached is that papers should not be made entirely from sorghum stock, and that mixtures of sorghum and wood pulp be used. This would serve to decrease pulp importations and would also serve agriculture in

Fig. 1

Southern France. Figure 1 shows a three months growth of sorghum in Spain. The author however regrets what he considers the cavalier treatment that his views (first published 19 years ago, and repeatedly since) have received in France.

Eight references and 3 tables are given. Rene Escourrou. *Papeterie* 82, 29 to 37 (1960) (in French).

A chipper with horizontal infeed

This new type of chipper and its development are described. Whereas bolts of wood are usually fed to the chippers by means of sloping pockets, the chipper that was tested by the author was served by a horizontal infeed. Evidently the machine proved entirely satisfactory, although the author indicates that when the bolts carry much dirt or are too dry, they should have a preliminary washing. Special attention is given to the position of the knives,

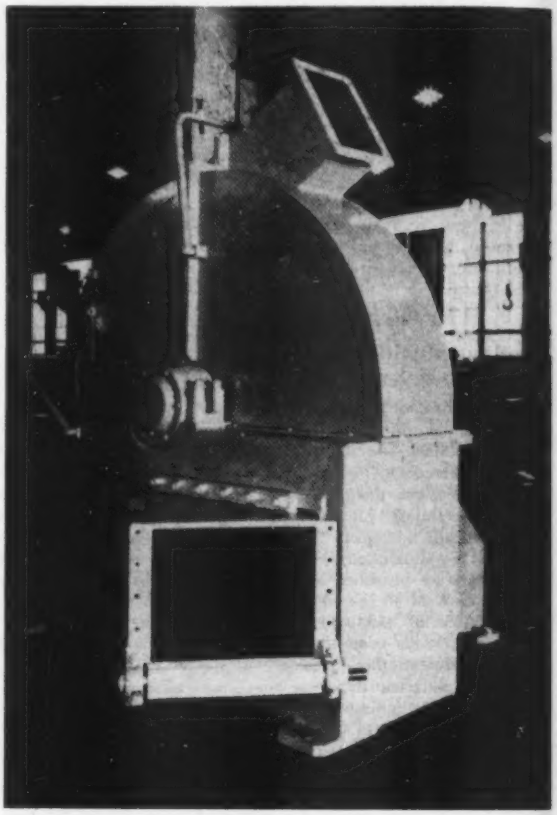

Fig. 2

which are so placed that the speed with which the wood passes through the chipper is kept uniform.

The operation can be carried out without much vibration, and only an inexpensive foundation is required. A horizontal feed chipper is shown in Figure 2. The chipper knives are fixed in special pockets and can be removed rapidly, thus lowering the cost of maintenance. Knives, when dulled, can be adjusted quite simply outside of the chipper.

The construction and power demands, as well as chip removal, are discussed. Sidney Hansel. *Das Papier* 14, 56 to 58 (1960).

Purification of pulp from reeds in China

The magnesium-base sulfite process was used in making a reed paper grade pulp, which was subsequently purified by various treatments. These involved hot and cold alkali and acids, or combinations of these, with a view towards producing a suitable rayon pulp. The product was analyzed for α-cellulose, ash and pentosan content (furfural). Although hot and cold alkaline refining raised the α-cellulose content, the pentosan content could not be lowered sufficiently (as indicated by a minimal 5-per cent furfural). Hot alkali lowered the ash content to 0.307 per cent, which proved too high for a dissolving pulp. Treatment with 60-per cent sulfuric acid increased the α-cellulose and also lowered the furfural content. Thus, the most promising treatment involved a combination of acid and hot alkaline treatments. Apparently reed pulp resists chemical refining more than does pulp from wheat straw.

Yen-Ling Cheng and Yu-Ying Chang. *Acta Chim. Sinica* 22, No. 3, 147 to 155 (1956) (original in Chinese with English summary) (through *Abstr. Bull. Inst. Paper Chem.* 30, 792 (1960).

CHEMICAL USERS' GUIDE

To General Chemical Products for the Paper Industry

Product	Available Forms	Commercial Strengths	Shipping Containers	Applications
Aluminum Sulfate $Al_2(SO_4)_3 \cdot 14H_2O$ approx. *(Alum)*	Commercial & Iron Free: Lump, Ground Powdered	17.25% Al_2O_3	Bags Bulk Carloads	Precipitation of rosin size and filler; water clarification; manufacture of satin white; pitch control; mordant for dyes.
Aluminum Sulfate $Al_2(SO_4)_3$ + Water *(Liquid Alum)*	Commercial & Iron Free: Liquid	36.5° Be (8.3% Al_2O_3)	Tank Trucks Tank Cars	Same as commercial dry product but lower strength.
Salt Cake Na_2SO_4 *(Sodium Sulfate)*	White or Grayish Granules	99.5% Na_2SO_4 95% Na_2SO_4	Bags Bulk Carloads	Used in kraft cooking liquors as the source of Na_2S.
Sulfuric Acid H_2SO_4 + Water	Liquid	66° Be (93.2% H_2SO_4)	Carboys Drums Tank Trucks Tank Cars	Wire souring; parchmentizing; acid wash in last stage of multi-stage pulp bleaching; neutralizing tall oil soaps.
Sodium Thiosulfate, Crystal $Na_2S_2O_3 \cdot 5H_2O$ *(Hypo)*	Colorless Crystals	99.75% $Na_2S_2O_3 \cdot 5H_2O$	Bags Fibre Drums	Anti-chlor.
Sodium Thiosulfate, Anhyd. $Na_2S_2O_3$ *(Hypo)*	White Granules	98% $Na_2S_2O_3$	Bags Fibre Drums	Anti-chlor.
Sodium Sulfite, Anhyd. Na_2SO_3 *("Sulfite")*	White Powder	98.5% Na_2SO_3	Bags Fibre Drums	Anti-chlor.
Sodium Silicate $Na_2O \cdot XSiO_2$ + Water	Liquid	38° to 60° Be Various ratios of Na_2O to SiO_2	Drums Tank Trucks Tank Cars	Adhesive for corrugated and solid fibre board; used in coating mixtures to reduce viscosity and in beater sizing to stiffen paper. Aid in bleaching & flocculation.
Chromium Potassium Sulfate $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$ *(Potash Chrome Alum)*	Red Violet Crystals	99.5% $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$	Fibre Drums	Used in "save-all" or white water systems.
Aqua Ammonia NH_4OH + Water *(Ammonia)*	Colorless Liquid	26° Be (29.4% NH_3)	Carboys Drums Tank Trucks	Used with chlorine to form chloramines for slime control. Biological sludge systems nutrient.
Sodium Fluoride	White Powder	98% NaF	Bags Fibre Drums	Preservative and stabilizer for starch in coating mixtures.
Tetrasodium Pyrophosphate, Anhyd. $Na_4P_2O_7$ *(Pyro)*	White Powder	52.1% P_2O_5	Bags Fibre Drums	Felt washing; pitch dispersion.
Sodium Tripolyphosphate $Na_5P_3O_{10}$ *(Tripoly)*	White Powder	56% P_2O_5	Bags Fibre Drums	Felt washing; pitch dispersion.
Nitric Acid HNO_3 + Water	Liquid	42° Be (67.2% HNO_3)	Carboys Drums Tank Trucks Tank Cars	Nitrating pulp; cleaning monel metal.
Phosphoric Acid, Com'l. H_3PO_4	Liquid	75% H_3PO_4 (54% P_2O_5)	Tank Cars	Nutrient in biological sludge systems.
Hydrochloric Acid *(Muriatic Acid)*	Liquid	18°, 20°, 22° Be (27.4% to 34.1% HCl)	Carboys Drums Tank Trucks Tank Cars	Cleaning machinery.

The products advertised are commercial chemicals having various uses, some of which may be covered by patents, and the user must accept full responsibility for compliance therewith.

OTHER PRODUCTS: Sodium Metasilicate; Trisodium Phosphate; Copper Sulphate; Disodium Phosphate; Sodium Bisulfite.

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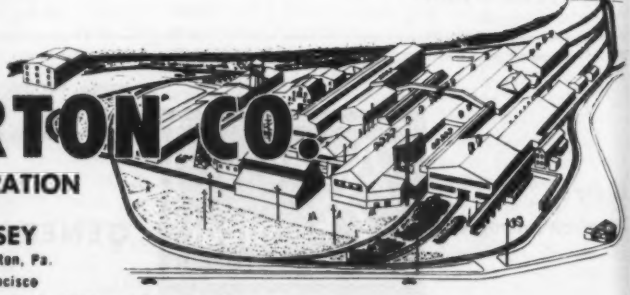

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PATENT REVIEWS

MELVIN NORD*

Controlling the flow of stock through a slice jet

U. S. 2,904,461, issued Sept. 15, 1959, to Robert S. Washburn and Charles W. E. Walker and assigned to Beloit Iron Works, describes a method and apparatus for controlling the flow of stock through a slice jet, which overcomes the jet velocity suppression that occurs along the side walls of the head box which leads to thinness of the forming web along the edges. In essence, the present invention involves the concept of flowing independently controlled streams of stock into the head box between the stock inlet and slice gate for purposes of making adjustments in the slice jet laterally across the machine.

In Figures 1 and 2, there is shown a head box 10 which consists of a slice gate 11, a rear wall 12, side walls 13 and 14, and a horizontal bottom 15 (terminating with an apron 15a at the slice 16). As shown in Figure 2, there is also a top wall 17, so that this is a closed head box 10 in which the level L of stock in a pond within the head box 10 is maintained by the use of a blow hole 18 in the side wall 13 and a source of air 19 under pressure, which maintains air pressure on the level L of stock. An increase in the level L of the stock will cover the blow hole 18 and cause an increase in air pressure from the source 19 so as to urge the stock level back to the blow hole 18, and a reduction in the level of stock appreciably below the blow hole 18 will result in a loss of pressure in the head box 10, so that the stock level L will move back up to the blow hole 18.

The stock feeds into the head box 10 via a stock inlet 20 through the bottom or floor 15 at one end of the head box 10, and then flows out through the slice gate 16 at the opposite end onto a forming wire 21, wound around a breast roll 22. Stock-flow control means, in the form of a pair of stacked rectifier rolls 23 and 24, is provided between the inlet 20 and the slice gate 16 in the head box 10.

The stock flows onto the wire 21 through the slice gate 16, as shown in Figure 1, to the first suction flat box 25, where the dry line, indicated in dash lines at 26, appears. In the preferred operation, the dry line appears, as indicated in the dash lines, to extend in a substantially straight line laterally across the wire 21. However, in conventional machines, there is a tendency for the dry line to curve up at the edges 26a, as indicated in dotted lines. This receding portion 26a of the dry line 26, is caused by the fact that

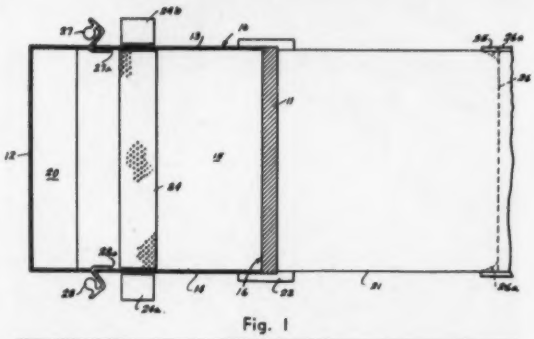

Fig. 1

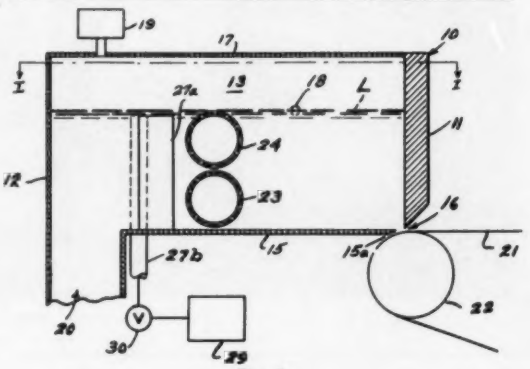

Fig. 2

the stock flow velocity is slowed down along the edges of the head box 10 at the side walls 13 and 14, and a thinner stock flows onto the wire 21. This is overcome in the practice of the present invention by the use of conduits 27 and 28 along each side wall 13 and 14, respectively, for increasing the stock flow speed within the head box 10 along the side walls 13 and 14.

Counter-current bleaching of pulp

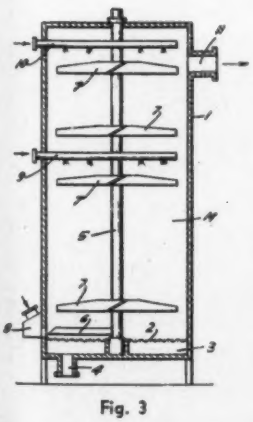

Fig. 3

U. S. 2,916,346, issued Dec. 8, 1959 to Matti J. Jalkanen and assigned to Rauma-Repola Oy, describes a method and apparatus for bleaching cellulosic pulps, in which the two stages of chemical treatment and rinsing are continuously carried out in a single tower as successive stages.

As shown in Fig. 3, pulp slurry under pressure is introduced through the pipe shaft end 8 into the main chamber M of the tower. Then, as smaller pressure prevails in the drain chamber 3, a part of the suspension liquid drains through the perforated false bottom 2 into the chamber 3 and is conducted away by the discharge pipe 4. Therefore, the pulp slurry will thicken on the upper surface of the perforated false bottom and, given travelling energy by the scraper arm 6 and the pulp slurry continuously entering through pipe 8, the thickened pulp slurry will rise towards the discharge opening 11. Into this thickened mass of rising pulp is admitted, at suitable points, bleaching solution by way of pipe 9, and then wash water through pipe 10. In the top part of the tower, the agitator arms 7 carry out uniform mixing of pulp slurry and bleach and uniform mixing of bleaching pulp and rinsing water, and the wash water flowing downwardly through the mass of thickened pulp into the drain chamber frees the fibres from the products of the chemical reaction in the upper part of the main chamber. Then, on further downward flow, the wash water mixes with the bleaching solution introduced through pipe 9. Upon reaching the perforated false bottom 2, the wash water is practically exhausted of its bleach content and passes through bottom 2 into the drain chamber 3.

Improving the strength of paper

U.S. 2,916,413 issued Dec. 8, 1959 to John A. Harpham and assigned to Hercules Powder Co., describes a method of producing paper of improved strength.

Improved strength is obtained by employing, as a feed in the preparation of the paper, raw cotton linters which have been chemically modified and then purified. The chemical modification of the linters adds hydroxyalkyl substituent groups to the anhydroglucose unit in such an amount that the chemically modified linters retain the fibrous form of unmodified linters and are both water-insoluble and alkali-insoluble.

Improved strength properties carry over into the sized paper.

*Patent attorney, 17600 Pinehurst, Detroit 21.

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Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Collapsible rectangular container	Isaac L. Wilcox	2,904,239	"
Easy opening air-tight container	E. H. Southwell Co.	2,904,240	"
Bag	Bemis Bro. Bag Co.	2,904,241	"
Making filter paper heat sealable	Adam Sorg et al.	2,904,448	"
Manufacture of conductive glass paper	General Electric Co.	2,904,457	"
Continuous pulping process	University of Florida	2,904,460	"
Apparatus for impregnating wood chips	Waldorf Paper Products Co.	2,905,240	9/22/59
Light bulb carton	Mead-Atlanta Paper Co.	2,905,316	"
Article carrier	Federal Paper Board Co., Inc.	2,905,359	"
Hinged cover paperboard carton	Continental Can Co., Inc.	2,906,444	9/29/59
Packing carton liner for sensitive instruments	Allen B. Tabakof et al	2,906,445	"
Bag	Bemis Bro. Bag Co.	2,906,446	"
High yield bisulfite pulping process	Abitibi Power & Paper Co.	2,906,659	"
Manufacture of paper-making wet felt	Draper Brothers Co.	2,907,093	10/6/59
Press section of a paper-making machine	Stewart E. Seaman	2,907,388	"
Bottle carrier crate	Container Corp. of America	2,907,509	"
Carton	Continental Paper Co.	2,907,510	"
Reclosable cartons	Foil Cartons, Inc.	2,907,511	"
Shipping and dispensing cartons	The New Haven Board & Carton Co.	2,907,512	"
Cardboard boxes	Robert M. Thiolat	2,907,513	"
Apparatus for screening pulp	John P. Rich et al	2,908,390	10/13/59
Multi-ply carton construction	Owens-Illinois Glass Co.	2,908,436	"
Digester control system	Worthington Corp.	2,909,239	10/20/59
Shipping and dispensing cartons	The New Haven Board & Carton Co.	2,909,310	"
Multiple cell cartons	Marvin R. Levitt	2,909,311	"
Tear strip box	Walworth Engineering Co.	2,909,312	"
Recovery of chemicals from waste lyes	Stora Kopparbergs Bergslags Aktiebolag	2,909,407	"
Dryer section for paper machines	Beloit Iron Works	2,909,847 2,909,849	10/27/59 "
Drum drier mechanism	Beloit Iron Works	2,910,219	"
Base-type holder for paper containers	American Can Co.		
Produce tray	Longview Fibre Co.	2,910,220	"
Crate	Chicago Mill & Lumber Co.	2,910,221	"
Press section	Beloit Iron Works	2,911,040	11/3/59
Stock distributor assembly	Beloit Iron Works	2,911,041	"
Suction-roll silencer	Beloit Iron Works	2,911,042	"
Display carton	Glaser Bros.	2,911,124	"
Bottle and can carrier	George R. Hotton	2,911,126	"
Milk cartons	John C. Mercer et al	2,911,135	"
Reinforced handle construction for cartons	Continental Can Co., Inc.	2,911,136	"
Burning of waste liquors	Combustion Engineering, Inc.	2,911,284	"
Disintegration of fibrous material	John W. Bolton & Sons, Inc.	2,911,334	"
Moisture retaining container	The Lawrence Paper Co.	2,912,152	11/10/59
Folding container	Ferdinand Lange	2,912,153	"
Folding paperboard carton	Continental Can Co., Inc.	2,912,154	"
Treatment of paper stocks	Howard Bidwell et al	2,912,174	"
Machine for tearing paper into strips	John S. Fleming	2,913,160	11/17/59
Plant package	Waldorf Paper Products Co.	2,913,161	"
Box construction with stacking tab	Joseph Goltz	2,913,162	"
Production of pulp from bagasse	International Pulp Products, Inc.	2,913,362	"
Forming reinforced pulp sheets	Norman P. Harshberger	2,913,363	"
Manufacture of bags	Bemis Bro. Bag Co.	2,913,966	11/24/59
Carton construction	S. Curtis & Son, Inc.	2,913,967	"
Pulp wood loader	Emil Gafner	2,914,203	"
Cartons	David Levkoff et al	2,914,233	"
Folded liquid containing box	Newth-Morris Box Corp. of Florida	2,914,234	"
Folded interlocked boxes	Container Corp. of America	2,914,235	"
Folding box construction	Royal-Pioneer Paper Box Mfg. Co., Inc.	2,914,236	"
Box structure	Fred Malmad	2,914,237	"
Paper winding apparatus	Kalamazoo Vegetable Parchment Co.	2,914,267	"

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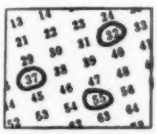

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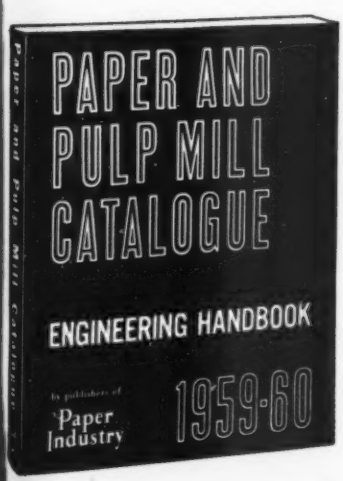

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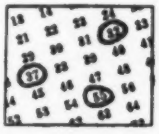

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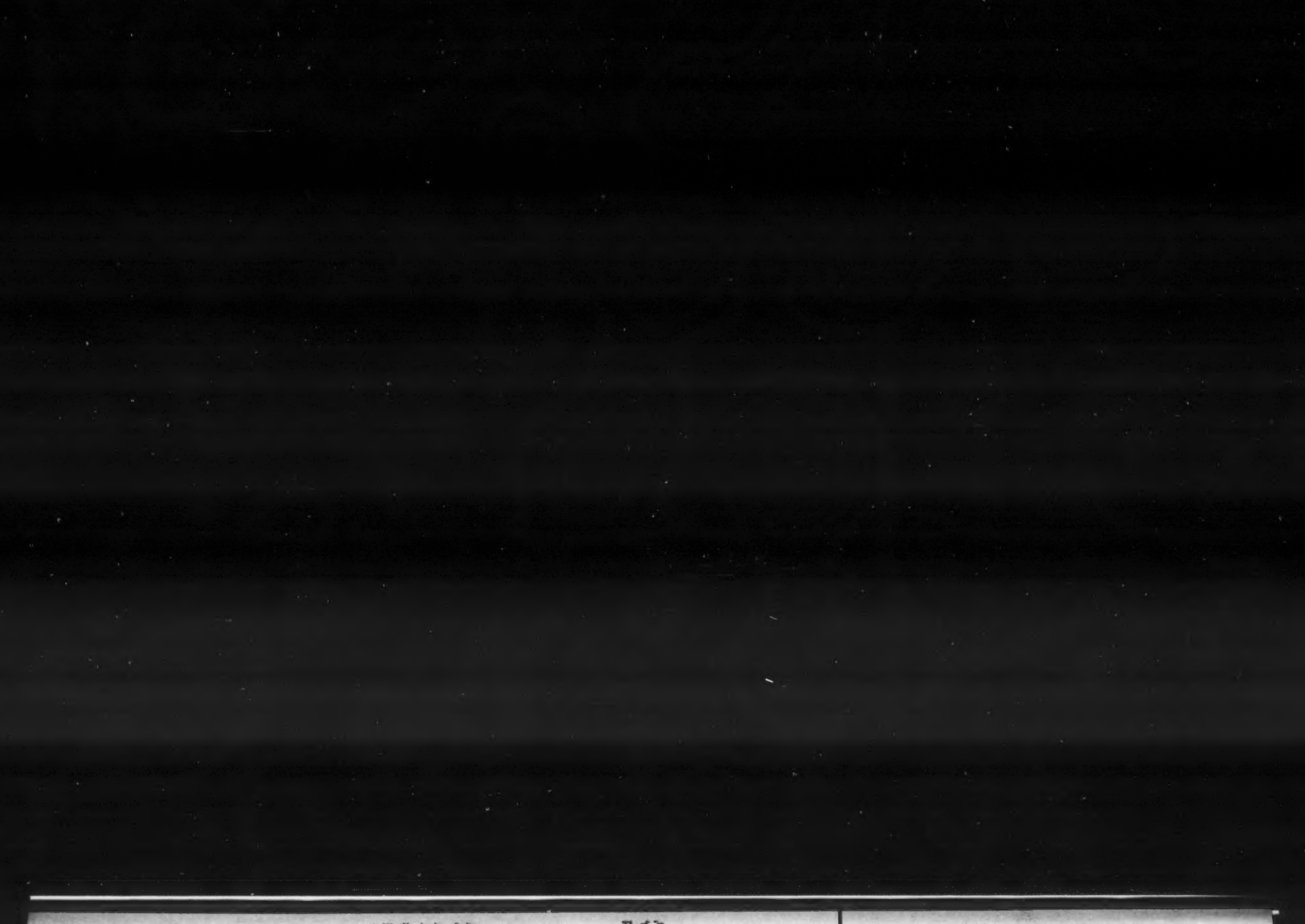

NEW PRODUCTS

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Centrifugal air compressor

The Clark H line, a new high-efficiency, multi-stage centrifugal air compressor, is designed to furnish "100 lb. air" for oxygen plants, centralized air systems and other industrial air applications.

Design features of this compressor series include: Integral intercoolers between each stage of compression; Single case construction plus base mounting of the intercoolers cuts floor-space requirements; A simple throttling device provides regulation over a wide range of stable operation and to unload the compressor during start-up; The unit can be equipped with variable inlet guide vanes when optimum efficiency at reduced capacities is required.

Six case sizes are available with horsepowers ranging from 1000 to 8000 and capacities from 5000 to 38,000 cfm. Each unit is furnished as a complete package including matching driver, intercoolers and lubricating system. *Clark Bros. Co.*

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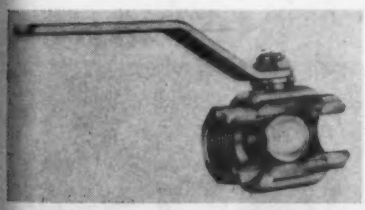


Ball-valve line

Major products in this new line are the McCannaseal and the McCannaflo ball valves, both of which provide the full flow of a gate valve, the tight shut-off of a globe or needle valve and the quick quarter-turn of the plug valve. (Cutaway of McCannaflo valve illustrated above)

Both valves are reportedly capable of taking temperatures up to 350° F. and pressures up to 700 psi for the McCannaseal and 1000 psi for the McCannaflo. They are constructed to handle practically all fluids, semi-solids, compressed gases and compressed air. Standard body metals include stainless steel, cast steel, ductile iron, cast iron or bronze. The valve balls are chrome-plated carbon steel, bronze or stainless steel. Valve sizes range from ¼ to 6 in. in screwed or flanged end connections. *Hills-McCanna Co.*

Circle No. 2 on Readers' Service Card

Skid turner

A completely automatic and portable skid turner, known as the Southworth model ST-5, is said to have opened up a wide range of possibilities for the improvement of materials handling in the finishing room. In addition to saving time and labor, this skid turner offers certain operating advantages such as the reduction of waste, more accurate trim, easier skid to pallet transfer and a quicker method of inverting paper to meet customers' shipping specifications.

With a reported capacity of up to 5000 lb., the skid turner is ready to operate as soon as delivered. Shipping weight is approximately 4000 lb. The machine is 96 by 60 by 96 in. (LWH); size of skids, 28 by 38 in. to 52 by 76 in. *Southworth Machine Co.*

Circle No. 3 on Readers' Service Card

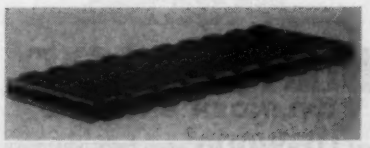
Microthene

A finely divided polyethylene powder, called Microthene, unlike conventional polyethylene cubes, can be used with inexpensive equipment and in markets outside the plastics industry.

Many uses for finely divided polyethylene such as textile coatings, drum linings and specialized paper coatings have already found markets in Europe. Wire and glass coatings are other applications that show promise.

Two different types of Microthene, made by separate processes, are available from the manufacturer. One, a solution process, is used to produce rounded powdered polyethylene primarily in the smaller than 200-mesh range (up to 75 microns). A different process, mechanical grinding, produces a coarser range; from 50 to 200 mesh. *U. S. Industrial Chemicals Co., a Division of National Distillers & Chemical Corp.*

Circle No. 4 on Readers' Service Card

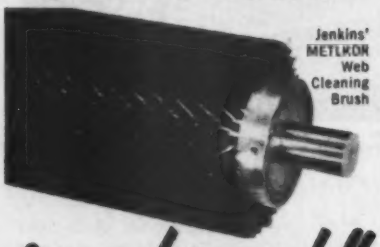


Anti-vibration material

Vibra-check, manufactured to fill the need for an efficient, economical and reusable anti-vibrational material, is designed to be placed under the base or feet of machinery.

"a brush

is a brush



is a brush"

Poetically speaking, true! But there's no brush like a Jenkins' METLKOR brush. Paper Mill men everywhere say it's true. There are "Look-Alikes", "Just-as-Goods", "Steals", "Terrific Bargains" . . . but only one Jenkins' METLKOR. They are built better, to perform better, to last longer. Result . . . improved product, greater satisfaction and economy.

JENKINS' PAPER MILL BRUSHES

Blanket washer • Coating • Conveyor • Dampening • Dusting • Feed • Felt cleaning • Flocking • Fourdrinier wire cleaning • Nutmeg roll cover • Offset powder removal • Paint brush • Polishing • Scrap removal • Sleve • Spray • Static elimination • Void detector • Web cleaning.

BRUSHES FOR PRINTERS: Cylinder hold down • Dusting • Nutmeg roll cover • Offset dampener roll cleaning • Offset powder removal.

Specify Jenkins' METLKOR
the original . . . the best *Metal-Core* brush

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and LIFEWOOD® WOOD BACKED BRUSHES

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For more data circle 134 on Post Card

New Products . . .

Under high shock load, this product reportedly shows no deformation or permanent set. Its high breaking point of 7500 psi, its dimensional stability and high-impact flexural and tensile strength insure its re-usability. Resistant to moisture, oils, greases, detergents, brine, solvents, and many other chemicals, Vibra-check is available in 22- by 23-in. sheets, or it can be furnished cut to sizes suitable for the base or feet of any machine in such manner as to yield a unit loading of between 50 to 100 psi, the area of greatest vibration-absorptive efficiency. *Lowell Industries Inc.*

Circle No. 5 on Readers' Service Card

ULOK cube air filter

Designed for use in commercial and industrial air conditioning and heating, dust entrapment and process air systems, the ULOK cube air filter is said to combine high efficiency with exceptionally low pressure-drop throughout its useful life.

The high-capacity filtering action of the new unit has been attributed to a lightweight Dynel modacrylic filtering medium, a uniquely processed filter batt, and open-side cube construction.

Units are available with standard face areas measuring 20 by 20, 20 by 25, 16 by 20 or 16 by 25 in. For each of these, there are units that measure 8, 11 and 20 in. in the direction parallel to the air stream. *Union Carbide Development Co.*

Circle No. 6 on Readers' Service Card

Rotary gas meter

Employing a new concept in rotary-type, positive displacement gas-meter design, and aimed at providing accurate metering at lower cost, the 3M125 meter is a compact, low-capacity unit that is suitable for measuring commercial or industrial loads at pressures to 125 psig.

Weighing less than 55 lb., the meter has a reported flow range to 3000 cfh. It is constructed almost entirely of rigid, high-strength cast iron, sealed against gas leakage by an impregnation process, and gears and bearings are continuously lubricated by a simple dip-and-splash oiling system. The standard production meter is equipped with a volume register (or counter) which reads directly in cu. ft. of displaced gas. *Roots-Connersville Blower Div., Dresser Industries Inc.*

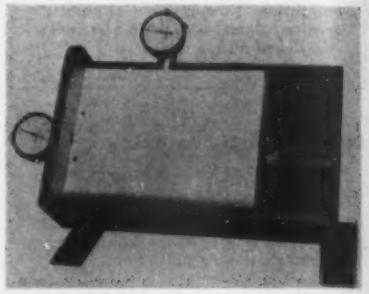
Circle No. 7 on Readers' Service Card

Monorail pallet stacker

A monorail pulp-bale stacker, now available, automatically stacks bales on a pallet for ship loading. The number of bales per stack is pre-set on the control panel by the machine operator. When the required number is reached, the stacker automatically builds up another pile of bales on the same pallet. This process continues until the pallet is completely loaded (four bale stacks of equal height), after which the carrier automatically shifts to a second pallet and the machine continues stacking while a fork-truck removes the loaded pallet.

The stacker can be pre-set to make only single stacks of pulp; therefore, the machine can be used without pallets for loading rail cars. *Lamb-Grays Harbor Co. Inc.*

Circle No. 8 on Readers' Service Card



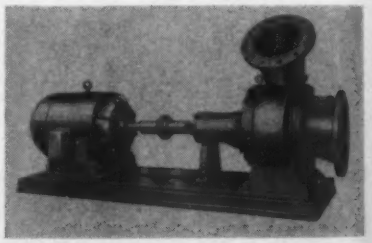
Paper size gauge

The "Murco" paper size gauge, now available, checks the accuracy of paper sizes. The illustration shows the gauge in use with 8½- by 11-in. sheets.

When accurately cut paper is placed on the bed plate, the dial indicator reads zero in both positions. Any cut that is off size, either on the width or cut of square, will immediately register plus or minus on the dial indicator.

Overall dimensions of the unit are 18 by 10 by 12 in. in length, depth and height; checking table is inclined to 45°. Minimum and maximum adjustable lengths are 7½ and 15 in., but a gauge larger or smaller can be furnished in order to meet special needs. *D. J. Murray Mfg. Co.*

Circle No. 9 on Readers' Service Card



Heavy-duty process pumps

With a capacity range up to 9500 gpm and for heads up to 220 ft., these heavy-duty process pumps are especially adapted for handling fluids with fibrous, granular or other type solids in suspension (whether abrasive or non-abrasive); thick liquids of all types such as paper stock, starches, slimes, slurries, etc. under operating conditions where temperatures up to 350° F. and working pressures up to 400 lb. are encountered.

Pumps are of the end-suction, vertically-

Get out the dirt... *she doesn't see!*

D-I LESTOIL LIQUID DETERGENT

No matter what grade of raw stock you use... no matter what care you take in sorting... there's always the danger that grease, oil, wax and other contaminants will get by — to create specs or shiners or otherwise blemish your finished sheet.

Today... increasing numbers of smart mill operators insure against these costly headaches by adding D-I LESTOIL when cooking rags.

D-I LESTOIL speeds up wet-out, assures uniform packing and cooking in the boiler; thoroughly penetrates every fiber. It emulsifies and disperses grease, graphite, wax... all dirt. Produces fibers free of soil, fibers that bleach readily and absorb dye uniformly.

D-I LESTOIL guards against redeposition of soil ... permits complete, free rinsing.

End result? Clean, bright sheets of uniform color and quality.

FREE!

A generous sample and complete details on how to get better quality paper with d-i LESTOIL!

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For more data circle 135 on Post Card

How our small plant solved its waste disposal problem WITHOUT CAPITAL OUTLAY....

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DEMPSTER-DUMPMASTER Equipped Hauler Provides Containers and Service for Small Fee

Our small Midwestern manufacturing firm did not generate enough refuse to justify ownership of its own refuse disposal system. Yet, it was plagued by unsightly trash piles, fire hazards and scattered refuse in the plant yard.

Our plant engineer then heard of a DEMPSTER-DUMPMASTER equipped private hauler in the adjoining city. A survey revealed that two big-capacity refuse containers, placed one at each end of the plant, would handle the entire refuse accumulation.

The private hauler placed the containers, and a small monthly fee covered maintenance, labor, hauling and dumping refuse. No capital outlay was involved, disposal costs were reduced, and plant housekeeping was vastly improved.

In all major cities, private haulers who own DEMPSTER-DUMPMASTER equipment render fast, efficient, low-cost refuse storage and collection service. They place one or 100 containers at your service for a reasonable fee. A free brochure describes their service in detail.

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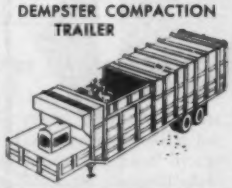
DEMPSTER COMPACTION TRAILER



DEMPSTER DUMPMASTER EQUIPPED PRIVATE HAULERS

For more data circle 136 on Post Card

New Products . . .

split type, featuring back pull-out assembly. All pumps have 45° self-venting discharge connections as standard. Seven types of materials of construction are available including stainless steel. *Goulds Pumps Inc.*

Circle No. 10 on Readers' Service Card

Metal edger

A metal tear edging machine with integral construction, now available, supplies a metal tear edge or strip to cartons which dispense foil, waxed paper, etc. The machine's versatility allows application of the tear strip to either the edge or one panel-back of a carton blank. This all new assembly incorporates a control console and power motor all within a single frame unit; a feature unknown in other existing machines of this type.

The edger is available in two sizes. Series "C" handles all-size carton blanks from 7 to 24 in.; series "D" accommodates blanks from 8 to 30 in. *Faustel Inc.*

Circle No. 11 on Readers' Service Card

Paper-coating latex

Dow latex 630, a new type of styrene/butadiene latex for pigmented paper and paperboard coatings, is said to be markedly different from previous copolymers.

This product has been reported to have superior pick resistance, high shear stability, improved starch compatibility, and is said to impart the highest degree of printability when used in paper and paperboard coatings. Improvement of wet pick resistance and indications of body stock strengthening, coupled with excellent dry pick resistance, suggest wide utility for all types of printed papers. *Dow Chemical Co.*

Circle No. 12 on Readers' Service Card

Boiler return system

Built in ten sizes with a boiler capacity range from 100 to 2000 hp., the Duplex boiler return system is said to save fuel and steam, while permitting high pressure boilers and steam processing units to operate at top efficiency.

The system automatically maintains a positive differential between steam supply and return lines. As a result, condensate and air are quickly evacuated from the steam line, which permits processing units to operate continually at full capacity. Because condensate is returned to the boiler usually within 10° of the saturated steam temperature, steam requirements are reduced. *Stickle Steam Specialties Co.*

Circle No. 13 on Readers' Service Card

Proximity switch

Consisting of a sensor and a separate transistorized amplifier with plug-in relay, this proximity switch is designed for use as limit, interlock, counter or indicator sensors under such unfavorable environments as those created by oil, grit, extreme vibration, dirt or sludge.

The new switch, said to be capable of sensing products with highly polished surfaces without touching them, thus eliminates the possibility of scratching. In addition, it can detect small items without retarding their flow. Its versatility is demonstrated by the fact that it can be used to sense products ranging from automotive frames to bottle caps. The new unit is reported to have an adjustable sensitivity range of $\frac{1}{8}$ to $\frac{1}{2}$ in. *Minneapolis-Honeywell Regulator Co.*

Circle No. 14 on Readers' Service Card

Regulator combination

New combination temperature and pressure regulators are now available in sizes from $\frac{1}{2}$ to 2 in. Used to control temperature and pressures with only one regulator in the main line, this combination eliminates the need for two separate installations, simplifies piping, gives better control and is less costly.

The regulators are available with screwed ends, in standard body materials from stock; ductile iron (model 1168) or bronze (model 1268). Reported suitable for pressures to 250 psi and temperatures to 500° F., the regulators are said to accurately control temperatures from 35 to 450° F. with 10 ranges and pressures from 2 to 200 psi with 2 ranges. *OPW-Jordan Corp.*

Circle No. 15 on Readers' Service Card

Vacuum lifting equipment

Pressuregrip, a new vacuum lifting system, is adaptable for use in general purpose, overhead crane handling, or it can be custom engineered to perform many automatic or semi-automatic materials handling operations.

The two basic components of the system are a Vac-Pac motor and pump unit and a vacuum gripper. General purpose (under-the-hook) units are available in a variety of sizes and capacities up to 20 tons. Gripper positioning is fully adjustable in order to meet the requirements of handling

For more data circle 137 on Post Card

objects of different sizes and shapes.

Custom feeding equipment can be designed to perform many types of repetitive transfer operations. *Whiting Corp.*

Circle No. 16 on Readers' Service Card

Limit switch

A newly designed vane-operated limit switch, for use in controlling machinery travel, is smaller in size and costs less than the previous model. Initial forms of the new switch are available in either front- or top-operated models, normally open or normally closed single-pole contacts, with or without an indicating light. A mounting plate, with either form, can be rotated 90° in order to permit flexible mounting arrangements at the time of installation.

Armless, leverless and shaftless, this new magnetic device is reportedly capable of operating at any angle. Its cast aluminum enclosure is oil, dust and water resistant. *General Electric Co.*

Circle No. 17 on Readers' Service Card

Indicating transmitter

A new line of pneumatic indicating transmitters features measuring elements specifically designed for each major process variable, namely; pressure, flow, temperature, liquid level, differential pressure and dew point.

Known as the Model 45 series, the instruments also feature link and lever calibration and a minimum of moving parts; thus, they are easy to adjust and maintain. All instrument components are enclosed in a weatherproof steel case which has corrosion-resistant vinyl coating, gasketed door. Overall case dimensions: 9-¼ by 11-⅜ by 5 in. *Foxboro Co.*

Circle No. 18 on Readers' Service Card

Packing ring sets

Two types of resilient, low gland pressure packings for valves, heat exchangers and other static and semi-static jobs, have been placed on the market.

Known as Chempro style 300 (cup & cone) and style 305 (wedge), these TFE Teflon packing ring sets are said to make tight, secure seals under minimum gland pressure. The packings, for applications where rotation is not a factor, may be used on a wide range of rotating- and reciprocating-type equipment when properly combined with Chempro style 101 packing rings (the original TFE Teflon packing). *Chemical & Power Products Inc.*

Circle No. 19 on Readers' Service Card

Vertical chain oiler

Adaptable to all types of chain drives and operating speeds, this new vertical chain oiler is a flexible unit which consists of a brush applicator, an oil dispenser, and copper tubing connecting the two components.

Brush size is determined by chain size and operating conditions. There are four standard sizes: ⅜-, 1- and 1½-in. dia.; and one ⅜- by 2¼-in. rectangular brush. Horsehair bristle is used for general purpose applications, nylon for high-speed operation and stainless steel for high temperatures and chain cleaning. *Oil-Rite Corp.*

Circle No. 20 on Readers' Service Card

Jet-Cut paper knife

Made from high-alloy tool steel, and heat treated by a special process used in the heat treating of aviation alloys, the Jet-Cut paper knife is said to have super hardness and unexcelled wear resistance.

The new Jet-Cut is available in stock for all makes and sizes of cutters, and is shipped directly with minimum delay. Each knife is packaged in a chemically treated wrapping that keeps out moisture and assures corrosion-free storage. *Ohio Knife Co.*

Circle No. 21 on Readers' Service Card

Cutter-dispenser

A snap-action, clean cutting dispenser for Thred-Tape pipe joint sealer, just

BETTER CHIPS means BETTER cooking YIELD

MURCO ROUND LOG PULPWOOD CHIPPERS

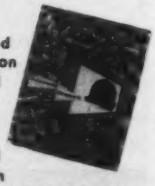
- **MADE IN DISC DIAMETERS FROM 36" TO 153".**
- **COMPACT, MURCO ROUND LOG PULPWOOD CHIPPERS REQUIRE LESS FLOOR SPACE.**

MURCO Round Log Pulpwood Chippers are designed to include the most desirable features for today's production requirements . . . the result of long and careful study of the various features that contribute to outstanding chipper performance in producing more and better chips at less cost . . . less sawdust, fewer slivers, freedom from repairs yet at the same time having production records of 100 cords or more per hour. The MURCO heavy design construction reduces vibration.

All backed by years of constant development so that each year results in an improved chipper design, the latest of which is MURCO UNI-CHIP that produces more uniform chips with less bruising.

MURCO UNI-CHIP is furnished "when specified" on all new MURCO Chippers — or your present MURCO Chipper can be adapted to it.

WRITE for MURCO Chipper booklet.



A complete and detailed story on pulpwood and wastewood chippers . . . specifications of each model . . . yours upon request. Write for it today.

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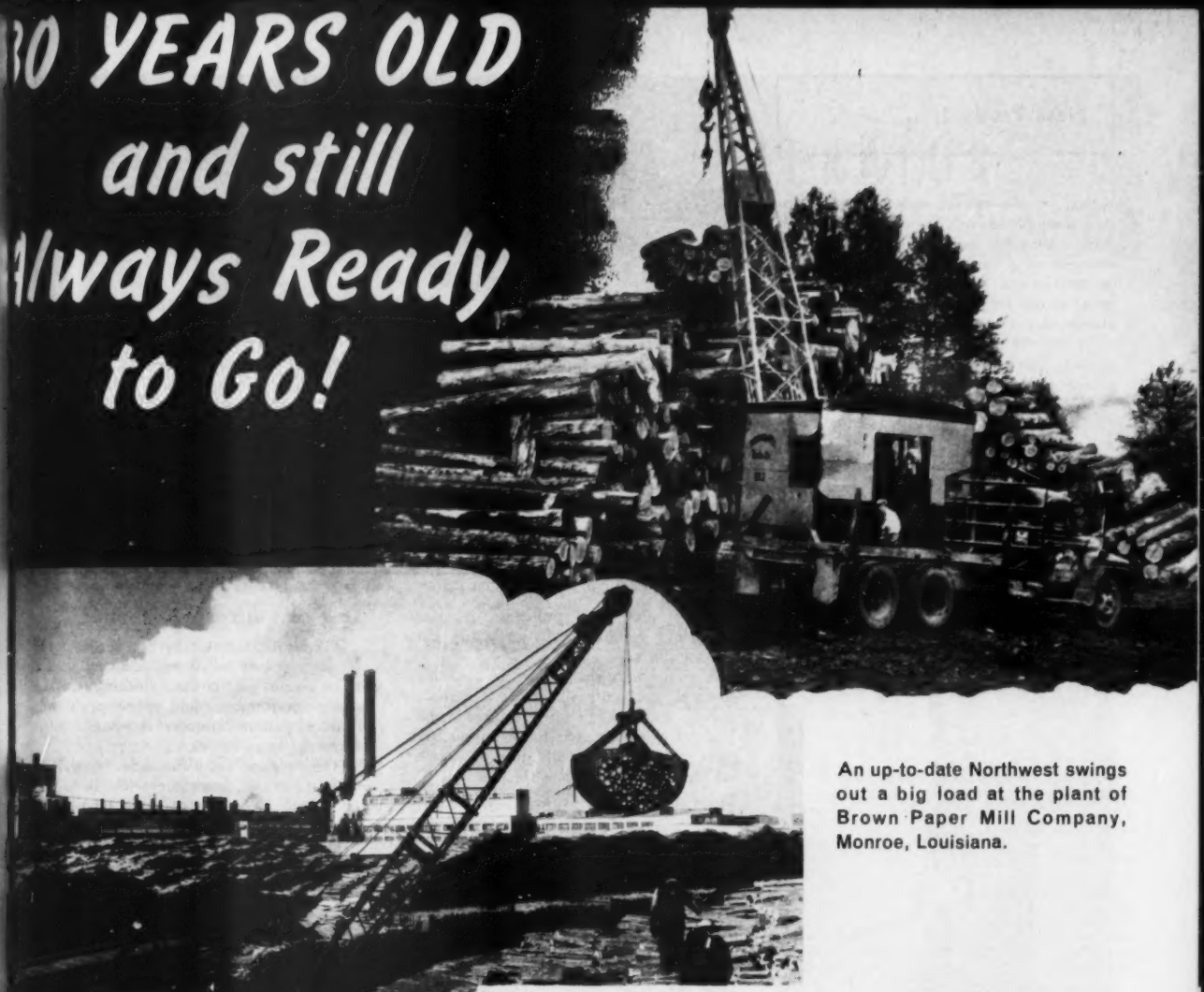


An up-to-date Northwest swings out a big load at the plant of Brown Paper Mill Company, Monroe, Louisiana.

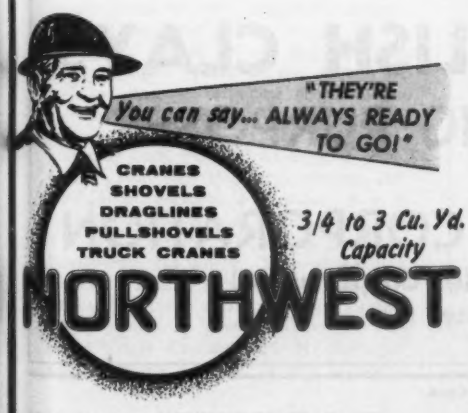
ONE of the amazing things about Northwest equipment in comparison with others is the length of time we find them being run *profitably*. This veteran Northwest is working for the Tubafor Mill at Morton, Washington. It went into service in 1931, almost 30 years ago. Thirty years and always ready to go. We hear it everywhere and Northwest users will tell you so.

We built 'em tough in those days but they are tougher today.

Northwest gives you a range of capacities from 13 to 60 tons. They make all of your pulpwood yard usable — handle high piling, load and unload cars and trucks, feed belt conveyors and stack either to regular piles or jackstraw.

With the Northwest Independent High Speed Boom Hoist you have smooth booming hour after hour for reach to the car or truck and high stacking. Uniform Pressure Swing Clutches are cool running and eliminate the jerks and grabs that delay spotting the grapple and endanger the men on the pile.

The Feather-Touch Clutch Control gives the true feel of the load and Northwest steering with positive traction on both crawlers, even while turning, takes the Northwest anywhere without tearing up roadway. These are just part of the reasons why so many well-known paper companies like St. Regis, Brown, Scott Paper Company, National Container Corporation and many more are using them. *Don't buy a crane for your pulp handling without getting full details on the Northwest.*



G-20-L

NORTHWEST ENGINEERING COMPANY

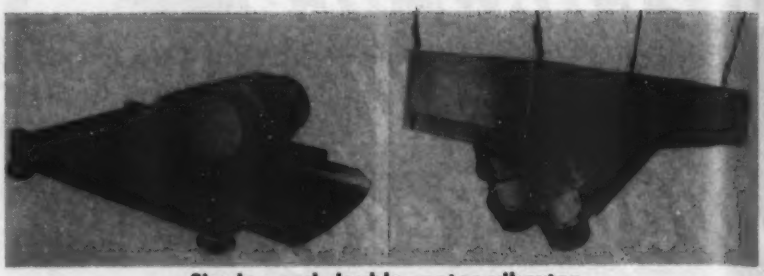
1508 Field Building • 135 South LaSalle Street • Chicago 3, Illinois

New Products . . .

placed on the market, incorporates a cutting assembly made of chrome plated steel with a tempered and ground edge which is clamped on a clear plastic container. It also provides a simple, efficient and dirt-proof means for handling the tape and constantly shows the amount available.

The new dispenser is designed to accommodate Thred-Tape in the ½-in.-wide size and is said to have sufficient capacity to hold either a 288- or 567-in. roll. It is re-usable and easily opened to insert a new roll. *Crane Packing Co.*

Circle No. 22 on Readers' Service Card

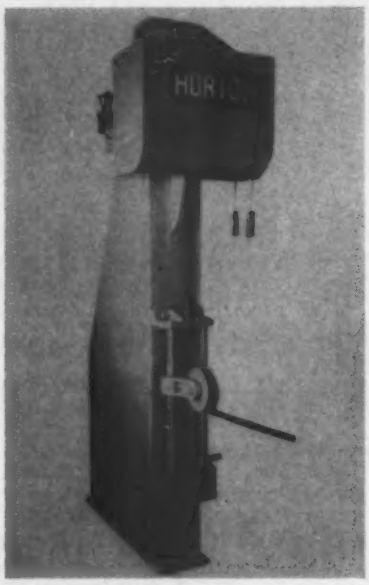


Single- and double-motor vibrator

An extensive line of motorized counterweight vibrating feeders has recently been expanded by the addition of 49 sizes in two motor capacities. These machines are compact, low-headroom devices for feeding a wide range of bulk materials (heavy, sticky ores to light, dry grains) from bins, hoppers, storage piles or conveyors, at a uniform rate.

The new twin-motor feeders include 31 sizes with capacities from 275 to 1700 tons per hr.; the single-motor feeders include 18 sizes with capacities from 5 to 525 tph. Both types are available with special modifications such as feeders with pre-designed hoppers, scalping decks and live-bottom hoppers. *Link-Belt Co.*

Circle No. 23 on Readers' Service Card



Core and shaft puller

For use in plants where large rolls of heavy materials must be handled, this new machine pulls cores or shafts from jumbo rolls. It is designed for installation in existing plant areas, requiring a floor space of only 10 by 32 in. Completely adjustable, the core and shaft puller is reportedly capable of handling rolls in a dia. range of 34 to 84 in.

A companion shaft dolly is also available. Hydraulically operated, it raises or lowers the core to the required height. The dolly is also used for handling heavy cores, when 'shafting up' rolls in converting operations. *Horton Mfg. Co. Inc.*

Circle No. 24 on Readers' Service Card

Screw and ribbon flight conveyors

A new line of stainless-steel helicoid screw conveyors and ribbon flight conveyors, with special design features to meet sanitary requirements of the chemical and food industries, are available in dia. sizes from 4 to 12 in.

Standard features include outboard mounted bearings with inboard, removable mechanical seals or stuffing boxes; hinged, drop-bottom troughs held in place by quick-opening clamps; top covers secured by pivoted "U" type clamps or toggle clamps. Dust-tight operation is assured by the use of food-grade hollow core and bead neoprene gasketing. *Bucket Elevator Co.*

Circle No. 25 on Readers' Service Card

Low-cost ultrasonic cleaner

The diSONtegrator system forty, a full ½-gal. capacity ultrasonic cleaner, is said to compare (in power, cleaning-tank capacity, performance and appearance) with other ultrasonic cleaners now selling for up to ten times its price.

The 'system forty' includes model G-40C1, a 40-w. generator with an output of 90,000 cycles/sec. With a cabinet that measures 10 by 8 by 5-¾ in. (LWH), this model features a single control knob. *Ultrasonic Industries Inc.*

Circle No. 26 on Readers' Service Card

Improved Statikil formula

For use in neutralizing static electricity, an improved Statikil formula is now available. Packaged in self-spraying cans or bulk, this product has numerous applications for retarding static electricity in both industrial and consumer use. It may be used on industrial machinery, meters, indicators, plastic materials and machinery, paper stock and paper manufacturing and printing machinery, plastic auto seat covers, carpeting, etc. *Statikil Inc.*

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NEW LITERATURE

Books

HOT ORGANIC COATINGS, by Raymond B. Seymour Published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 233 pp. $7.50.
Especially valuable for finishing, packaging and corrosion engineers, this book concisely presents the constitution, applications and properties of hot organic protective coatings. The book contains chapters on materials such as asphalt, coal tar pitch, petroleum waxes and cellulose derivatives. Specific information or formulations of proprietary products is included.

Other chapters deal with hot melt applications without solvent such as peel coatings, protective linings, flame spraying and the fluidized bed process. George B. McComb, consultant to the leading suppliers of pipe line coatings, has contributed a chapter on hot applied coal tar pitch base coatings.

AUTOMATING THE MANUFACTURING PROCESS, by George F. Hawley. Published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 147 pp. $4.95.
Helping management and production personnel to gain a greater appreciation of the risks encountered in successful automation, this book also provides designers and development engineers with ideas which should minimize their failures. In practical terms, the author presents some of the mechanical problems involved in the invention and designing of machinery for specific operations, such as assembly of components, packaging of individual products, bottle capping, feeding, etc.

Booklets

1960 DIRECTORY OF OCCUPATIONAL SAFETY POSTERS, a 72-page publication, contains 780 miniatured illustrations of available posters which are designed for use in various industries and the occupations related thereto. Posters are grouped into the following broad subject classifications: General Appeal; Miscellaneous—including score sheets, signs, rules, horseplay, etc.; Falls; Housekeeping; Electricity; Materials Handling—manual and mechanical; Seasonal & Holiday; Fire & Explosion; First Aid & Health; Chemicals & Gases; Clothing & Personal Protective Equipment; Machinery; Tools—hand and powered; Traffic; Motor Transportation—trucks, buses and taxicabs. Copies of this directory may be obtained from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill., at the following prices: 1 to 9, $.60 each; 10, $.45 each; 100, $.35 each. Members receive a ten-per cent discount on these prices.

RECORDER SURVEY: RECORDING SURFACES AND MARKING METHODS, a 41-page circular, covers some of the physical principles either currently or potentially available for recording variable measurands in laboratory experimentation or industrial production. This publication surveys and compares characteristics of continuous traces, dotted traces and printed characters produced by inking, impression, indentation, deposition, heat, light, electric discharge, electron beam, magnetism, chemical action, or fluid streamlines. This National Bureau of Standards Circular No. 601 is obtainable, at 30 cents per copy, from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

USDA Reports

THE FOLLOWING TECHNICAL NOTES are obtainable from M. B. Dickerman, director of the Lake States Forest Experiment Station, U. S. Dept. of Agriculture Forest Service, St. Paul 1, Minn.: No. 559, Simple Measures Can Improve Wisconsin's Farm Woodlands (The Mixed Oak Type); No. 560, Heavy Thinning Increases Tree Size and Yield in an Upper Michigan Northern Hardwood Pole Stand; No. 561, Sugar Maple and Yellow Birch Seed Dispersal from a Fully Stocked Stand of Mature Northern Hardwoods in the Upper Peninsula of Michigan; No. 562, Commercial Forest Land in Wisconsin Counties by Forest Type; No. 563, Sawtimber Log Grades in Wisconsin; No. 564, Pattern of Soil Moisture Depletion Varies Between Red Pine and Oak Stands in Michigan; No. 565, 1958 Forest Tree Seed Crop Poor in the Lake States; No. 566, Air Seasoning of Wood Reduces Charcoal Production Time; No. 567, Veneer Log Production Declines Sharply in Lake States as Result of Mill Closures, 1958.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Manual on Kofilm starches

National Starch & Chemical Corp. is offering a 64-page manual on the chemistry and industrial utilization of Kofilm starches. Besides describing the reactivity and compatibility of the Kofilms with commonly employed materials in surface sizing and coating applications, the manual supplies specific formulations which have been used with excellent results on a variety of paper and board stocks, including milk carton, paper cup, frozen food, patent coated box-board, offset paper and other smiliar grades. The manual provides numerous graphs and charts illustrating the physical properties of Kofilms under various conditions of use. A comprehensive glossary of terms used in the application of starch to paper and pertinent charts and tables useful for the computations are also included.

Circle No. 28 on Readers' Service Card

Unwind and wind equipment

Dilts Division, Black-Clawson Co. Inc., welcomes your request for an 8-page bulletin which features new designs of their continuous-operation unwind and wind equipment. The text gives model specifications and design features. In addition, each model is illustrated by a photograph and several schematic diagrams.

Circle No. 29 on Readers' Service Card

Circuline sludge collectors

Link-Belt Co. welcomes your request for Book 2546, a presentation of the company's complete line of six series and 15 types of Circuline collectors available for water, sewage and industrial waste treatment settling tanks. The new 28-page book announces two new series ("U" & "A") and six new types of collectors. Replete with engineering drawings and data, the book contains two tables; one gives the required surface area for various flows and surface loadings for a given settling-tank size, and the other shows how to determine tank dimensions, volume and weir length.

Circle No. 30 on Readers' Service Card

Revised products bulletin

Farval Division, Eaton Mfg. Co., has published a newly revised general brochure, available upon request, which contains information on their complete line of centralized systems of lubrication. The bulletin has been increased to 24 pages to cover new additions to the Farval line. Advantages of Farval centralized lubrication and principles of operation are discussed, as well as system components. Illustrations of typical applications are also included.

Circle No. 31 on Readers' Service Card

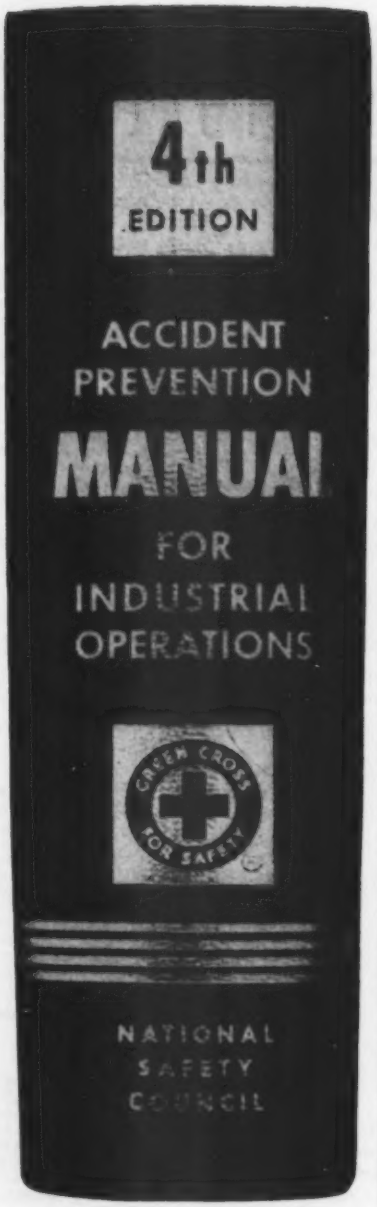
Design-guide booklet

Monsanto Chemical Co. has published a 24-page booklet that illustrates 18 new and potentially large-volume applications for liquid-resistant paper and paper board products. Designed by Monsanto and offered to the paper industry as a promotional service, these product applications include convenience packages for the food industry, merchandising aids for the floral industry, disposable coolers for picnics and several novelty items.

Circle No. 32 on Readers' Service Card

Metering pumps catalog

Lapp Insulator Co. Inc., Process Equipment Div., welcomes your request for their new 28-page catalog which describes the use of Pulsafeeder metering pumps in process industries such as pulp and paper, textiles, ore flotation, etc. The catalog also gives a detailed description (with drawings) on how the Pulsafeeder functions, various-type reagent heads available for effective metering of difficult fluids, and tables, which show capacities, sizes and specifi-



The new *4th Edition of the Accident Prevention Manual* contains over 1500 pages, over 500 illustrations and photographs—was reviewed by nearly 400 safety specialists from all industries before publication. It's the most complete, most accurate, most up-to-date safety manual available.

Single copy price $15.50. Use this stock number (121.51) when ordering.

NATIONAL SAFETY COUNCIL

425 North Michigan Ave., Chicago 11, Illinois

For more data circle 141 on Post Card

cations on various pump models. Information is included on auto-pneumatic and electronic controls.

Circle No. 33 on Readers' Service Card

"Quilon" chrome complex

Industrial & Biochemicals Dept., E. I. du Pont de Nemours & Co., welcomes your request for their new 26-page technical booklet which discusses the use of "Quilon" chrome complex in treating paper products. The booklet provides information on Quilon's application on corrugator units, its properties in PVA-based release coatings, expanded end-use possibilities, performance data and complete patent listings.

Circle No. 34 on Readers' Service Card

Data sheet on water conditioning

Betz Laboratories Inc. has made a new water conditioning data sheet available. Entitled "How corrosion attacks industrial water systems, this data sheet explains how and why boiler, cooling and process water systems are constantly plagued by corrosion.

Circle No. 35 on Readers' Service Card

Solvofen HM bulletin

Antara Chemicals, a Sales Division of General Aniline & Film Corp., is offering a four-page bulletin which describes properties and applications of Solvofen HM, a dyeing assistant and solvent. The brochure lists specific uses in textile applications (both with natural and synthetic fibers), lists potential uses in pasting and dispersing of certain classes of dyestuffs, and describes cleaning procedures involving removal of dyestuffs and pigments from rubber and metal equipment as well as woolen felts. Product data is also given.

Circle No. 36 on Readers' Service Card

Electric motor operators

Jamesbury Corp. has announced the availability of a product data sheet on electric motor operators for use with all Jamesbury "double seal" ball valves in the ¼- to 4-in. size range.

The data sheet includes drawings and dimensions for 2 sizes of motor operators. A wiring diagram and a chart which points out temperature characteristics are also shown.

Circle No. 37 on Readers' Service Card

Ventilation products bulletin

Heil Process Equipment Corp. welcomes your request for their bulletin which describes Rigivin (rigid vinyl) and Rigidon (reinforced plastic) collecting hoods, ducts, stacks, elbows and other fittings. The 17-page bulletin lists standard sizes, specifications and chemical resistance data and includes illustrative photographs and diagrams of the equipment.

Circle No. 38 on Readers' Service Card

PVAc brochure

Dewey & Almy Chemical Division, W. R. Grace & Co., is offering a newly published brochure which describes Darex vinyl acetate homopolymer and copolymer emulsions, their properties and suggested applications. The brochure also serves as a jacket for filing D&A technical data sheets on specific products.

Circle No. 39 on Readers' Service Card

Evolution of condensate drainage

Cochrane Corp. has prepared a paper on the solution of the problem of obtaining maximum and efficient latent heat transfer from steam to a product which will be of interest to all operators of steam process plants utilizing revolving drum dryers, jacketed equipment, submerged coils, air heating coils, platen and stationary presses, etc.

Circle No. 40 on Readers' Service Card

Testing machines brochure

Testing Machines Inc. is offering a six-page folder containing pertinent data on the following testing machines: Vanceometer-oil absorption; News ink penetrating; Gurley-Cobb sizing; Williams oil penetration; Valley size; Carson curl size; Currier size KBB galvanic size; Prism with clamp, system BEKK; Vapometer; Penescope; TMI oil penetration (model B); Photovolt pH meters — line-operated (models 85, 110 and 115), battery-operated (models 125 and 125-B) and a line-operated electronic (model 25).

Circle No. 41 on Readers' Service Card

The Paper Industry
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Opportunity for experienced Chemist or Chemical Engineer on growing R&D Staff, for investigation of pulp and paper, processes, and conversion methods in the fields of vulcanized fibre and laminated plastics. Fourdrinier Specialty paper experience helpful. Salary based on experience and qualifications. All replies confidential. Reply with complete information to:

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Attractive present and future prospects with New York and Penn. Extensive experience required on operating and production problems with machines making broad range of lightweight printing and converting grades. Paper and pulp school or engineering education preferred. Confidences respected.

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RETIRING?

Add to your retirement income by making your paper mill knowledge pay off. Spare time. No selling. Write Box 690, The Paper Industry.

HELP WANTED

Paper chemist with mill experience in paper and coating wanted for technical sales service. Willing to travel as required. Send resume, photograph and salary required. Replies will be treated in strict confidence. Box 696, The Paper Industry.

STATIC ELECTRICITY steals profits, causes fires and explosions! Kill it with inexpensive, trouble-free Static Eliminator Brushes. Fully guaranteed—thousands in use. Send for free illustrated folder today. Western Brush Co., Dept. P., 215 S. Western Chicago 12, Illinois.

Chemical sales service representative to call on New England paper mills for established chemical company. Reply giving education and background to Box 697, The Paper Industry.

GET THE SCOOP ON SCOOPS

If you have a dryer drainage problem, don't do anything about it until you see the movie—

"Condensate Behavior in Rotary Dryers"

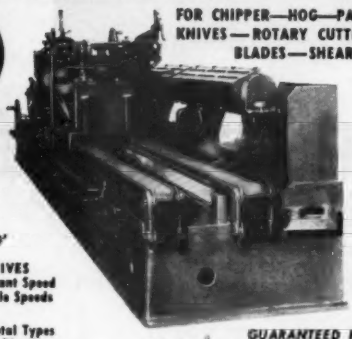
This 15 minute sound color film shows what goes on inside a dryer at a wide range of speeds . . . shows why conventional syphons lose efficiency at higher speeds . . . shows how to get condensate out at any speed. For a showing, contact your Armstrong Representative or write direct.

ARMSTRONG SYPHON SCOOPS
ARMSTRONG MACHINE WORKS
8162 Maple Street Three Rivers, Mich.
Manufacturers of Armstrong Inverted Bucket Steam Traps
For more data circle 142 on Post Card

HANCHETT KNIFE GRINDERS

MODEL AK AUTOMATIC

FOR CHIPPER—HOG—PAPER—VENEER KNIVES — ROTARY CUTTERS — DOCTOR BLADES — SHEAR BLADES, ETC



EXTRA HEAVY DUTY Traveling Wheel Type
Capacity— 84" to 396"
Motors— 7½ to 40 HP
Speeds—10' to 100' and faster
TRANSMISSION DRIVES
Mechanical—Constant Speed
Hydraulic—Variable Speeds
WHEELS
Cylinder or Segmental Types
16 — 20 — 24" Diameter

1. Guaranteed Construction
2. Finest Materials
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GUARANTEED PERFORMANCE
REAL WORK HORSES

We Guarantee our Machines to Deliver the Maximum in Precision Ground Knives per Hour with the Finest and Sharpest Edges for Longer and Better Cutting Action

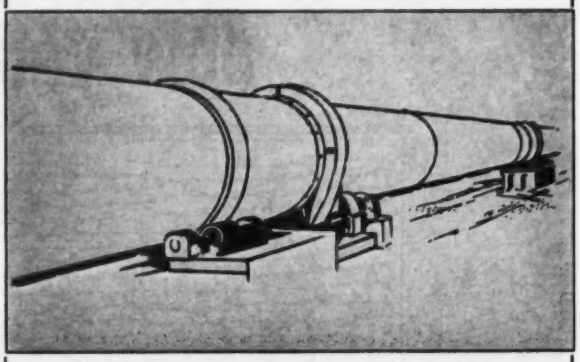
MODEL GK AUTOMATIC

HEAVY DUTY Traveling Table Type
Capacity — 32" to 196"
Motors — 5 - 7½ - 10 - 15 HP
Table Speeds — Hydraulic (10' to 80' per min.); Mechanical (Constant)
Gears — Hardened
Bearings — Ball and Roller Types
OTHER MODELS
MODEL "DN" — For normal knife requirements — Sizes — 32" to 108"; Motors — 3 - 5 HP; Wheels — 10" to 14" Diameter — also Straight Wheel and Circular Knife Grinders

TABLE DRIVES
Mechanical
Hydraulic
Electrical

HANCHETT MANUFACTURING COMPANY
Main Plant BIG RAPIDS, MICHIGAN
West Coast PORTLAND 1, OREGON
For more data circle 144 on Post Card

REBURNING LIME SLUDGE?



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Wilkes-Barre, Pa. Cable Address: Vulworks
"The Oldest Name In Rotary Kilns"
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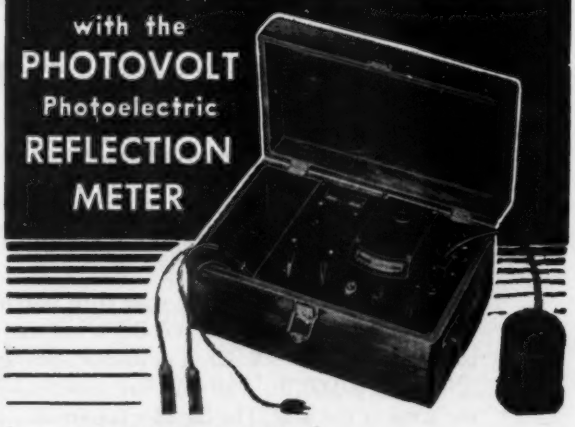
You Can Be Sure!

with the PHOTOVOLT Photoelectric REFLECTION METER



for accurate measurement of
Brightness and Opacity
of pulp and paper in terms of TAPPI specifications.
Also for *Gloss and Color*
tests on paper, card board, and other paper products.
Portable, reliable, rugged, simple to operate
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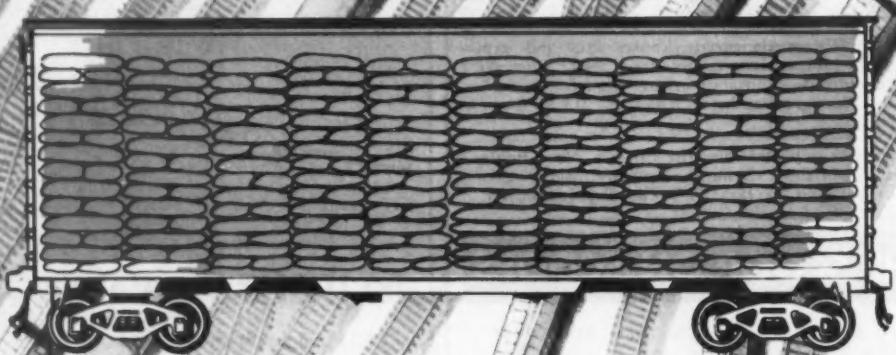

starch uniformity by the carload

from the world's largest blender

New Penick & Ford Blender ensures production quantities at pilot plant tolerances

The big advantage of having your corn starches mixed in the world's largest blender is not size of batch, but the perfect starch uniformity you get . . . up to 60,000 lb. with one bag exactly the same as the next. The blender is part of Penick & Ford's new starch derivative plant which is designed to deliver corn products of improved quality and precise uniformity. With its new facility, P & F can offer industrial starch users production quantities to exact customer specifications, no matter how large or small the order. Call

PENICK & FORD, LTD.

INCORPORATED

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For more data circle 146 on Post Card

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light sileslas	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
Underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cuttings	6.75— 7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.
No. 1 roofing (Chicago)	.60— .65
No. 2 roofing (Chicago)	.50— .55
Twos and blues, repacked	1.50— 1.75
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

Nominal:
- New dark cuttings
- New mixed cuttings
- New light sileslas
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light exfords
- New light prints

Old Rags

per cwt.

Nominal:
- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light printe
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manilla rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	95.00—100.00
No. 1 hard white shavings	75.00— 80.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	60.00— 65.00
Fly leaf shavings No. 1	30.00— 35.00
Fly leaf, woody, No. 1	25.00— 27.50
Mixed colored shavings	21.00— 23.00
No. 1 books and magazines	18.00— 20.00
Ledger stock, white, No. 1	45.00— 50.00
Ledger stock colored, No. 1 (Midwest ship)	40.00—
New manila envelope cuttings (free of groundwood)	70.00— 75.00
New manila envelope cuttings (containing groundwood)	50.00— 55.00
Manila tab cards	65.00— 70.00
Colored tab cards	50.00— 52.50
New northern kraft envelope cuttings	65.00— 70.00
Triple sorted kraft, 100%	35.00— 37.00
No. 1 old kraft	30.00—
White news cuts, No. 1	50.00— 55.00
No. 1 overissue news	17.00— 19.00
Folded news, special	15.00— 16.00
Folded news, ordinary	13.00— 14.00
Old corrugated boxes	18.00— 19.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	11.00— 13.00
Boxboard cuttings	4.00— 5.00
No. 1 mixed paper	6.00— 7.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
1-Arginine, drums, kilo	90.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	145.00—
L. c. l., ton	155.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	10.00— 12.00
300-mesh bags, c.l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— .35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.15—
Glycerine, refined (CP, USP) 99%, drums c. l., delivered lb.	.30⅞—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb.	.13¾—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	13.50—
N	13.85—
WG	14.00—
WW	14.50—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	12.00— 12.25
N	12.35— 12.45
WG	12.55—
WW	12.75— 12.85
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85--
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.65—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09⅛—
High-tinting, drums, c. l., lb.	.14⅜—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15⅜—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.55
No. 2 enamels	19.55
Machine-coated, 45- to 100-lb.	15.55— 19.00
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	22.25
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	21.10
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	—
75% "	—
50% "	—
25% "	—
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	—
75% "	—
50% "	—
25% "	—
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	8.75
60-lb.	9.00
50-lb.	9.25
40-lb.	9.50
35-lb.	10.00
30-lb.	10.75
25-lb.	11.50
20-lb.	12.50
No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.25

(Sheets — Plus 50c cwt)

Necrology . . .

(Continued from page 49)

Fred Kranhold

Fred Kranhold, 82, was assistant general superintendent of Kimberly-Clark Corp. He was also a founder of the American Pulp & Paper Mill Superintendents Association (now known as the Paper Industry Management Association).

Kranhold was only 13 years old when he began his paper industry career in the old Tioga mill of Kimberly-Clark in 1891. He aided in the start-up of the new Kimberly-Clark in Niagara Falls, and was active in the start-up of an associate newsprint mill, now known as the Spruce Falls Power & Paper Co. Ltd. He retired in 1945.

E. T. Gardner

E. T. Gardner was a founder of the former Gardner Board & Carton Co., now known as the Gardner Division of Diamond National Corp.

In 1900 he joined his father, the late Colin Gardner, and the late George H. Harvey in founding the Colin Gardner Paper Co. in Middletown, Ohio. He served as president from 1917 to 1954 when he became chairman of the board.

Gardner was a member of the board for Mead Corp. in Dayton, and the Wrenn Paper Co. of Middletown. In 1952 he was honored by the Folding Paper Box Association of the Ohio Valley for "50 years of outstanding service in the paper industry".

Aston-Hill Mfg. Co.

Tom King of 13010 S. W. 63rd St., Portland 19, Ore., will represent the company as their Pacific Coast representative.

He will handle the work of the late John Roslund.

William Harrison Upson

William Upson was former president of the Upson Co., which he helped to organize in 1910. Other business affiliations included the United States Chamber of Commerce, the Flexible Insulation Association and the National Association of Manufacturers.

Edwin W. Schoenberger

Edwin Schoenberger served as Dean of the students at the Institute of Paper Chemistry since 1952. Apart from his many academic functions, he will be remembered for numerous formal and informal speeches, essays and reviews in which he advanced the popularized the history and science of papermaking. In 1959 he took on additional responsibilities as curator of the Dard Hunter Paper Museum at the Institute.

John Roslund

John Roslund had been serving as Pacific Coast representative for Asten-Hill Mfg. Co. He had been with the company for over 20 years.

Stanley H. Davis

Stanley Davis was president and founder of the S. H. Davis Paper Box Co. He is also credited with inventing a conveyor which was a forerunner to the automation of box manufacturing. He also played a part in the development of a machine which manufactures transparent boxes automatically.

Sulfate pulp mill

(Continued from page 28)

sion resistance and low installation costs were important factors in the engineer's choice of aluminum sheet for the conveyor system housing.

The extensive ventilation and air-conditioning system duct work was pre-fabricated in rivetted sections, and bolted together on the job, with angle iron brackets fastened to the walls as supports.

Throughout the mill there are dozens of instances where aluminum has replaced other metals, e.g., all runners and gratings as well as ladders leading to the machines with their guard and hand rails are of aluminum, and machinery safety guards are being replaced by aluminum.

B. C. Forest Products, manufactures bleached kraft at Crofton and is engaged, at other centers, in the production of such forest products as lumber and plywood.

The Company's adoption of aluminum for its entire fresh water supply system is expected to influence engineering departments of other similar industries throughout Canada and the United States.

Current Comments . . .

(Continued from page 37)

Financial reports

A financial report of more ordinary importance was that of International Paper Co. which disclosed that for the first time in history sales of any paper company had passed the billion dollar mark. Sales climbed in 1959 to a total of $1,030,208,695—an increase of 13 per cent from the 1958 figure. Chairman John H. Hinman, in his report, said that the uptrend in paper consumption is continuing. International's net income for the year was $83,610,637, equivalent to $6.21 per common share as compared with the 1958 earnings of $72,000,906, or $5.35 per share. International is currently paying $3 per share, but granted a stock dividend at the end of 1959.

A falling market for all securities did not offer much consolation to holders of paper mill securities. Common stocks dropped as compared with February and were materially lower than at the end of 1959. Paper mill issues, however, merely followed the general sentiment of the market with no adverse developments to cause selling pressure.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing prices	March 10, 1960	February 10, 1960
American Can	39⅝	42¾
Same Pref.	* 37⅝-38	36⅝
Celotex	30⅝	33⅛
Same Pref.	* 17⅞-18¼	18¾
Certain-Teed	13	13¼
Champion P & F Co.	36½	37
Same Pref.	* 89-91¼	* 90-92
Chesapeake of Va.	36¼	* 39⅜-40
Container	23⅞	25⅝
Same Pref.	* 83-86	* 84-85½
Continental Can	42½	43½
Same Pref.	* 78-80	80
Crown Zellerbach	44⅝	48½
Same Pref.	*100½-103	* 86
Diamond National	29⅝	33⅞
Same Pref.	—	29
Federal Paperboard	38⅞	41¾
Same Pref.	21¼	21½
Fibre Paperboard	44¾	44⅜
Great Northern	43	46½
Hammermill	27¾	31⅝
International	107½	114½
Same Pref.	* 89-92	* 86-87
Kimberly-Clark	68½	63
KVP-Suptherland	27⅜	29½
McAndrews & Forbes	28½	27⅞
Masonite	32	35½
Mead Corp.	40⅜	40½
Same Pref.	86⅛	* 86⅜-88
Minnesota & Ont.	29½	29⅞
Oxford Paper	28¼	30
Same Pref.	88	* 87-88½
Rayonier	20¼	23¼
Riegel Paper	34½	* 38¾-30
St. Regis	40	45⅞
Same Pref.	* 88⅛-90⅜	* 89¼-90
Scott	76⅞	74¾
Same $4 Pref.	86	* 84-85
Same $3.40 Pref.	* 72-78	* 74-78
Sealright	34⅞	36½
Standard Packaging	27½	30⅞
Same $1.60 Pref.	* 78½-94	* 90½-100
Same $1.20 Pref.	31¼	34¼
Union Bag-Camp	36½	37⅛
United B. & C.	* 22⅛-22⅜	25⅛
U. S. Gypsum	96½	90
Same Pref.	*148¾-151	150
West Va. P. & P.	40	45¾
Same Pref.	* 93½-95	* 92-94

New York Stock Exchange — Bonds

Champion P & F 4½%	106½	106½
Champion P & F 3¾%	85	83
Kimberly-Clark 3%	—	87½
Oxford 4¾%	104	105½
Scott 3%	102	99

American Stock Exchange — Stocks

American Writing	30½	32
Allied Paper	13⅛	14
Brown Co.	14¾	10½
Puget Sound P & T	23⅜	27⅝

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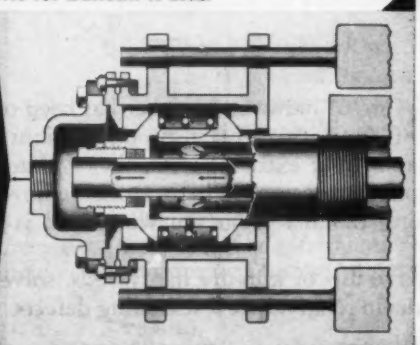

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A new product, manganesed-phospholene, developed by Western Reserve Laboratories, is said to dissolve rust and combine chemically with iron, steel or zinc surfaces to form a non-metallic, moisture- and water-proof coating. The material is brushed or sprayed onto the surface.

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The metals industry and chemical industry use more than 50 per cent of the entire industrial water consumption. The paper industry ranks third on the list with 13 per cent of the total industrial water usage.

Our water supply for all uses comes mainly from the "run-off" and ground water systems of the hydrologic cycle which amount to some 1,200 billion gal. per day. Man's total use of water for all purposes amounts to about 200 billion gallons per day.

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A new concept of flow measurement is based on the deflection of an ultrasonic beam when shot across a flow stream. The ultrasonic beam is generated by a ceramic transducer mounted on the outside wall of a pipe, with two crystal receivers attached to the other side of the pipe.

When there is no flow through the pipe, the two crystal receivers pick up equal signals. However, with increasing flow through the pipe the ultrasonic waves are deflected, depending on the velocity of flow, and cause one receiver to pick up strong signals. The difference between the signals of the two receivers is a measurement of flow. Its accuracy is claimed to be $\pm 1\frac{1}{2}$ per cent.

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A new method of quick drying of hardwood lumber has been tested successfully at the University of California forest products laboratory. Green boards are stacked in a vapor-tight extraction chamber and acetone at 130° F. is circulated at atmospheric pressure. The acetone removes water and certain chemicals (including tannin) from the wood and is continuously distilled and recirculated.

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